UK MET OFFICE
GLOBAL DATA MONITORING REPORT

July 2004

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Meteorological Office
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CONTENTS

1. Introduction

2. Global Data Monitoring Statistics

3. Composite Observing Systems for the North Atlantic (COSNA)

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Exeter. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Exeter in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Exeter and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Exeter and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Exeter and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbitting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Exeter during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Exeter in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Exeter from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.
27. November 2003. Included temperature and relative humidity statistics for ships, fixed buoys and platforms in Table 1.
28. November 2003. NOAA 17 statistics no longer available due to malfunction of the AMSU-A instrument.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison	:Background field from UKMO global model.
Observation times	:All hours
Elements monitored	:Mean sea level pressure (hPa). :Wind speed ($m\ s^{-1}$). :Wind direction (Degrees). :Air temperature (Degrees C). :Relative Humidity (%). :Sea surface temperature (Degrees).

Parameters monitored

:NOBS	:Number of observations received excluding duplicates.
:PGE	:Percentage of observations with gross errors.
:%REJ	:Percentage of observations flagged excluding those with gross errors.
:SD	:SD of difference of observations from background values excluding those with gross errors.
:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT

:15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)
:15 degrees (air temperature)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 $m\ s^{-1}$	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
	≥ 4 degrees	(air temperature)
	≥ 15%	(relative humidity)
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
	≥ 6 degrees	(air temperature)
	≥ 25%	(relative humidity)
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

```
IDENTIFIER   ELEM      NOBS    PGE   %REJ        SD      BIAS       RMS

AVOSTEST      P         213    100    100
A8CB7         P          23      0     70       2.2       4.2       4.7
A8DQ9         P          24      0    100       1.0       5.0       5.1
A8FA5         P          29      0     52       3.9       4.3       5.8
CGDS          P         128      1     16       3.3      -6.7       7.5

CG2522        P         612     45    100       3.2      -8.7       9.2
C6FE5         P          26      0      0       1.1       4.2       4.4
C6FV3         P          29      0      0       0.7       7.7       7.7
DIGW          P          31      0     42       1.6       4.1       4.4
DMRX          P          37      0      0       0.8       4.0       4.1

EIGB          P          53     23     40       4.0      -4.0       5.7
ELZN3         P          31      0      6       1.9       4.8       5.2
KS005         P          43      0      0       0.5      -4.0       4.1
OZTS2         P          49      0     43       0.8       4.5       4.5
PGON          P          39     49     82       0.9     -13.5      13.5

UAMY          P          44      0     36       4.9      -4.5       6.7
UAXG          P         108      0     63       1.2       4.9       5.0
VQBW2         P          46      2    100       4.8       4.7       6.7
ZCAS2         P          71      0     37       2.4       4.7       5.3
ZSDN          P          26      4     77       1.5       5.1       5.3

3FJA9         P          22      0     95       1.3       4.7       4.9
62166         P          67      0     31       3.9       4.1       5.7
IDENTIFIER   ELEM      NOBS    PGE   %REJ        SD      BIAS       RMS

DPTL         SPEED       60      0     58       5.1       7.2       8.8
FNTL         SPEED       68      6     26       4.7       5.4       7.1
KGJD         SPEED      282     61     78       9.0       8.1      12.1
VNVG         SPEED       32      0     50       4.8       7.6       8.9
V2HX         SPEED       26     12     35       6.1       6.1       8.7

44138        SPEED      692      0    100       2.3      -5.9       6.3
9MCD3        SPEED       41      2     20       3.9       5.7       6.9
IDENTIFIER   ELEM      NOBS    PGE   %REJ        SD      BIAS       RMS

AVOSTEST     DIRN.       20      0      0      10.9     *****     120.9
DGZO         DIRN.       22      0      0      84.1      21.9      86.9
KGJD         DIRN.      216     79      0      53.2     -42.4      68.0
KVWA         DIRN.       26      0      0      81.8      -7.8      82.2
VOCJ         DIRN.       40      0      0     109.8     -31.8     114.3

32304        DIRN.       31      0      0      99.0      34.0     104.7
IDENTIFIER   ELEM      NOBS    PGE   %REJ        SD      BIAS       RMS

AVOSTEST      T         213      0    100       3.6       5.2       6.4
DEOT          T         133      2    100       2.4       7.2       7.6
OUEU          T          45      4    100       3.4       4.0       5.2
UASX          T         104      0    100       3.3       4.4       5.5
UAXG          T         108     23    100       3.2      10.0      10.5

UCMS          T          34      0    100       2.9       4.1       5.0
UCTP          T          94     24    100       2.5      10.5      10.7
UEMM          T          46      4    100       1.8       6.0       6.3
UGGA          T          41      2    100       2.8       6.6       7.2
VYJN          T          26      0    100       3.5       4.6       5.8

WCAJ          T          20      0    100       3.5       4.1       5.4
WCW9126       T          78     26    100       2.0      11.1      11.3
WCY2920       T          72     10    100       5.0       4.8       7.0
WDB6493       T          56     18    100       4.0       9.4      10.3
WWU8          T          22     50    100       1.0      13.3      13.3

WYM9567       T          23     17    100       3.4       9.4      10.0
45141         T         309      5    100       3.0       8.6       9.1
45144         T         686      5    100       2.8       9.7      10.1
45150         T         509      0    100       2.5       4.2       4.9
46081         T         661      0    100       2.1       8.8       9.1
```

46088	T	405	5	100	4.2	-5.8	7.2

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
DBKV	RH	529	0	100	14.4	-32.4	35.5
DFPC	RH	105	0	100	13.7	22.8	26.6
ONAS	RH	24	0	100	14.5	-17.5	22.7
VRZZ5	RH	58	0	100	8.4	-15.3	17.4
46054	RH	231	0	100	10.2	17.3	20.1
46087	RH	304	0	100	11.9	19.4	22.7
46088	RH	402	0	100	20.1	23.4	30.8
62402	RH	52	0	100	7.0	-16.9	18.3

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8AX4	SST	28	0	46	2.3	-4.0	4.6
A8BZ6	SST	57	0	100	1.3	-3.1	3.4
A8CG3	SST	44	5	100	3.0	-4.1	5.1
CG2522	SST	45	44	402	3.9	3.4	5.2
DGZO	SST	23	0	35	2.1	3.7	4.3
ELZH9	SST	34	6	100	1.2	6.4	6.5
FNIN	SST	28	32	32	0.5	0.3	0.6
H3SM	SST	60	0	78	1.1	-4.3	4.4
KCB53	SST	21	5	81	2.2	5.0	5.5
KHRP	SST	24	0	29	1.5	3.4	3.7
KRNJ	SST	41	0	51	1.6	-3.5	3.9
KRPB	SST	53	0	100	1.8	-5.5	5.8
P3JA8	SST	64	0	16	1.6	3.1	3.5
SGBA	SST	47	0	70	1.6	4.8	5.0
SWYM	SST	20	0	90	2.1	-6.9	7.2
UAXG	SST	108	6	100	1.1	8.5	8.6
UBLX	SST	32	0	78	1.7	-4.7	5.0
UCMS	SST	34	0	56	2.4	4.4	5.0
UCOR	SST	40	0	40	1.6	-3.1	3.5
UHOM	SST	54	0	65	2.1	-3.2	3.8
UIDH	SST	33	0	100	0.8	3.6	3.6
VLTT	SST	107	36	50	1.5	-2.6	3.0
VOCJ	SST	228	0	100	1.3	3.6	3.8
VRVT2	SST	27	0	100	1.2	3.4	3.6
V2AI7	SST	25	0	100	1.6	5.8	6.0
WAUY	SST	33	0	100	2.8	-3.4	4.4
3FKM8	SST	30	0	100	1.0	-4.9	5.0
3FPA6	SST	59	0	100	1.4	4.9	5.1
44011	SST	686	0	71	0.7	-3.0	3.1
44034	SST	561	0	88	0.9	-4.0	4.1
44161	SST	686	0	100	0.8	3.6	3.7
45006	SST	229	0	55	1.9	3.2	3.8
45141	SST	313	56	100	0.9	8.3	8.4
45144	SST	679	91	100	0.7	8.9	9.0
45151	SST	641	0	100	0.9	3.1	3.3
45154	SST	692	0	68	1.5	3.4	3.7
46029	SST	230	0	79	0.8	-3.6	3.7

Figure 1. SHIP/SYNOP mean daily count. JULY 2004
All hours
Global average number of observations in 24 hours = 20019

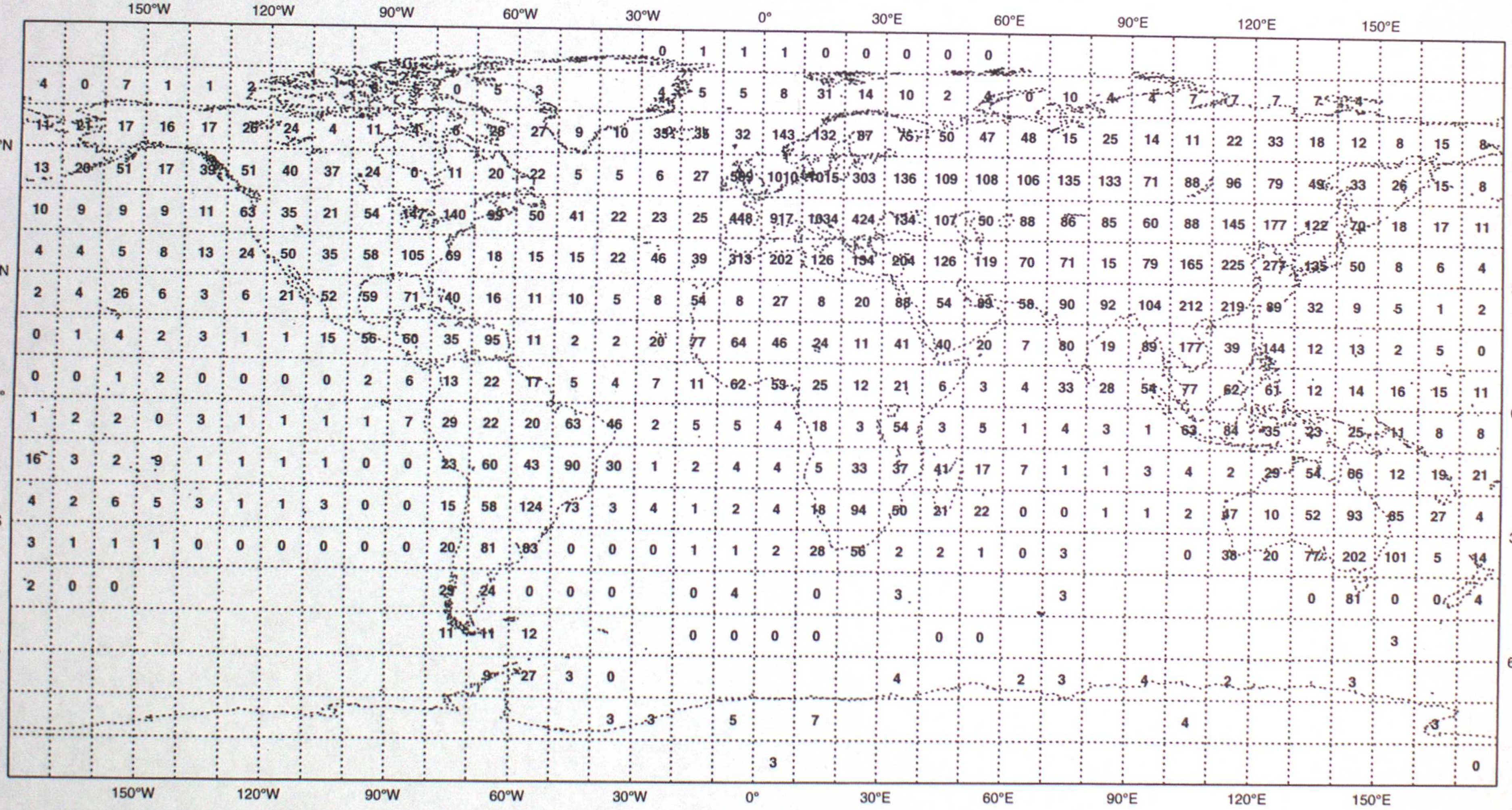

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 1 1 1 0 0 0 0 0
4 0 7 1 1 2 0 5 3 4 5 5 8 31 14 10 2 4 0 10 4 4 7 7 7 7 4
11 21 17 16 17 26 24 4 11 4 6 28 27 9 10 35 38 32 143 132 87 75 50 47 48 15 25 14 11 22 33 18 12 8 15 8
13 26 51 17 39 51 40 37 24 0 11 20 22 5 5 6 27 599 1010 1015 303 136 109 108 106 135 133 71 88 96 79 49 33 26 15 8
10 9 9 9 11 63 35 21 54 147 140 99 50 41 22 23 25 448 917 1034 424 134 107 50 88 86 85 60 88 145 177 122 70 18 17 11
4 4 5 8 13 24 50 35 58 105 69 18 15 15 22 46 39 313 202 126 194 204 126 119 70 71 15 79 165 225 277 135 50 8 6 4
2 4 26 6 3 6 21 52 59 71 40 16 11 10 5 8 54 8 27 8 20 88 54 99 58 90 92 104 212 219 89 32 9 5 1 2
0 1 4 2 3 1 1 15 56 60 35 95 11 2 2 20 77 64 46 24 11 41 40 20 7 80 19 89 177 39 144 12 13 2 5 0
0 0 1 2 0 0 0 0 2 6 13 22 17 5 4 7 11 62 53 25 12 21 6 3 4 33 28 54 77 62 61 12 14 16 15 11
1 2 2 0 3 1 1 1 1 7 29 22 20 63 46 2 5 5 4 18 3 54 3 5 1 4 3 1 63 84 35 23 25 11 8 8
16 3 2 9 1 1 1 1 0 0 23 60 43 90 30 1 2 4 4 5 33 37 41 17 7 1 1 3 4 2 29 54 86 12 19 21
4 2 6 5 3 1 1 3 0 0 15 58 124 73 3 4 1 2 4 18 94 50 21 22 0 0 1 1 2 37 10 52 93 65 27 4
3 1 1 1 0 0 0 0 0 0 20 81 83 0 0 0 1 1 2 28 56 2 2 1 0 3 0 38 20 77 202 101 5 14
2 0 0 29 24 0 0 0 0 4 0 3 3 0 81 0 0 4
11 11 12 0 0 0 0 0 0 3
9 27 3 0 4 2 3 4 2 3
3 3 5 7 4 3
3 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures

Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from UKMO global model.	
Position		:Average latitude and longitude for period.	
Observation times		: All hours	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees). :Sea surface temperature (degrees).	
Parameters monitored			
	:NOBS	:Number of observations received excluding duplicates.	
	:PGE	:Percentage of observations with gross errors.	
	:%REJ	: Percentage of observations flagged excluding those with gross errors	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa	(pressure)	
	:25 m s^{-1}	(vector wind)	
	:10 degrees	(sea surface temperature)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
		≥ 3 degrees	(sea surface temperature).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
		≥ 5 degrees	(sea surface temperature).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
16512	-44.5	89.5	P	622	55	82	4.2	7.9	8.9
16952	-31.2	109.5	P	177	0	85	2.7	7.6	8.1
25572	87.3	-130.6	P	37	100	100			
33658	-53.8	-38.8	P	86	60	98	3.5	9.5	10.1
41538	25.6	-74.9	P	211	100	100			
44629	47.1	-50.2	P	40	45	100	0.6	14.0	14.0
52684	11.7	134.9	P	954	0	100	4.5	-5.1	6.8
53598	-15.9	63.7	P	514	44	44	0.6	0.5	0.8
71599	-56.4	-15.9	P	424	4	48	5.3	4.4	6.9
74541	-57.5	7.2	P	328	54	73	5.9	4.4	7.4

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
41590	26.9	-62.8	SPEED	292	0	100	5.2	10.1	11.4

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
41542	24.5	-68.4	DIRN.	204	0	0	32.8	32.2	46.0
41595	23.9	-40.8	DIRN.	307	0	0	12.9	-30.6	33.2
48613	75.2	-15.6	DIRN.	95	5	0	164.7	-39.8	169.5
52523	33.8	139.9	DIRN.	126	1	0	58.2	92.3	109.1
52651	25.5	145.9	DIRN.	108	0	0	29.6	52.4	60.2

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
17522	-40.1	49.6	SST	30	0	100	0.1	-3.8	3.8
17666	-42.5	46.0	SST	34	0	100	0.4	5.0	5.0
22905	44.9	141.5	SST	348	0	66	1.2	3.0	3.2
32693	13.3	-145.1	SST	669	0	100	0.1	3.6	3.6
33502	-32.4	-7.0	SST	65	0	100	0.2	3.1	3.1
43535	29.5	-112.5	SST	57	5	112	2.6	4.1	4.9
43554	31.2	-113.7	SST	131	0	48	1.1	3.0	3.2
46972	17.2	170.9	SST	170	0	100	0.2	5.1	5.1

Figure 2. DRIFTER mean daily count. JULY 2004
All hours
Global average number of observations in 24 hours = 11251

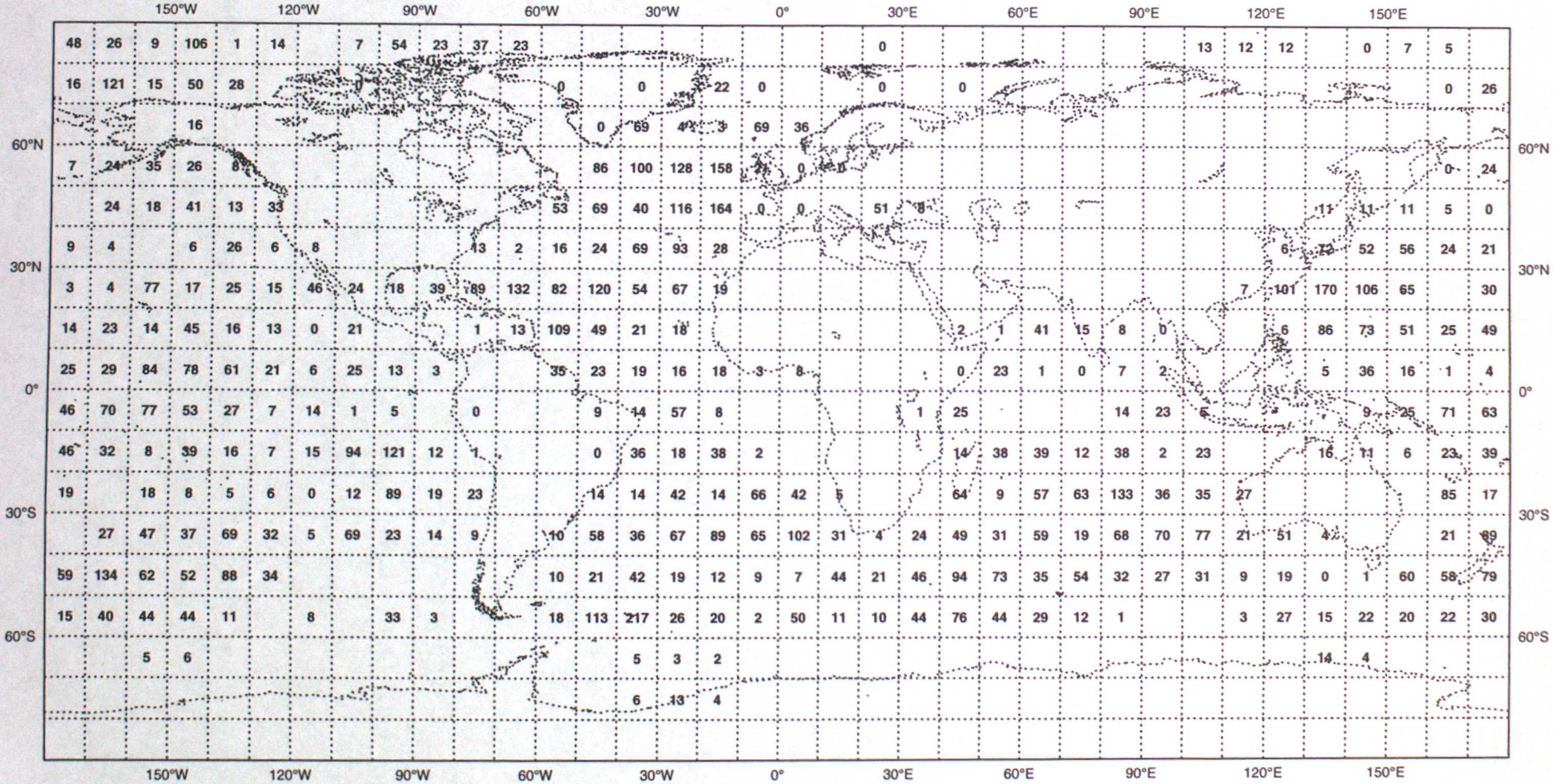

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
48 26 9 106 1 14 7 54 23 37 23 0 13 12 12 0 7 5
16 121 15 50 28 0 0 22 0 0 0 0 26
16 0 69 4 3 69 36
7 24 35 26 8 86 100 128 158 0 0 0 24
24 18 41 13 33 53 69 40 116 164 0 0 51 8 11 11 11 5 0
9 4 6 26 6 8 13 2 16 24 69 93 28 6 72 52 56 24 21
3 4 77 17 25 15 46 24 18 39 89 132 82 120 54 67 19 7 101 170 106 65 30
14 23 14 45 16 13 0 21 1 13 109 49 21 18 2 1 41 15 8 0 6 86 73 51 25 49
25 29 84 78 61 21 6 25 13 3 35 23 19 16 18 3 8 0 23 1 0 7 2 5 36 16 1 4
46 70 77 53 27 7 14 1 5 0 9 14 57 8 1 25 14 23 5 9 25 71 63
46 32 8 39 16 7 15 94 121 12 1 0 36 18 38 2 14 38 39 12 38 2 23 16 11 6 23 39
19 18 8 5 6 0 12 89 19 23 14 14 42 14 66 42 5 64 9 57 63 133 36 35 27 85 17
27 47 37 69 32 5 69 23 14 9 10 58 36 67 89 65 102 31 4 24 49 31 59 19 68 70 77 21 51 4 21 89
59 134 62 52 88 34 10 21 42 19 12 9 7 44 21 46 94 73 35 54 32 27 31 9 19 0 1 60 58 79
15 40 44 44 11 8 33 3 18 113 217 26 20 2 50 11 10 44 76 44 29 12 1 3 27 15 22 20 22 30
5 6 5 3 2 14 4
6 13 4

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION JUL 200

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.4W	2	MS	59	0	0	3	1.4	-9.3	9.4
62056	32.8N	21.8E	625	S	73	2	3	1	0.7	-5.4	5.4
62840	9.6N	31.6E	387	MS	51	1	2	0	1.3	-4.8	5.0
63330	13.5N	39.5E	2070	MS	21	20	95	0	0.0	-13.9	13.9
63801	4.9S	29.6E	882	S8	81	2	2	0	0.8	7.1	7.1
63881	8.0S	31.6E	1923	M	39	2	5	0	0.9	12.2	12.2
65355	9.8N	1.1E	342	MS	109	3	3	2	0.9	-13.2	13.2
68030	18.5S	25.6E	1071	8	83	1	1	0	2.0	4.5	4.9
68300	26.6S	15.1E	16	MS	106	55	52	0	0.3	-14.5	14.5
68396	26.5S	31.3E	641	S8	53	0	0	2	1.1	5.0	5.1
68575	30.0S	30.0E	1175	S8	115	115	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30554	54.5N	113.6E	995	MS	117	4	3	3	0.8	11.6	11.6
35416	49.1N	54.7E	128	S	116	0	0	0	0.6	4.0	4.0
36982	41.9N	78.2E	3635	S7	108	3	3	1	1.2	6.1	6.2
38565	40.6N	65.7E	485	MS	117	117	100	0			
38846	38.4N	70.0E	1437	S8	51	1	2	4	1.6	-6.3	6.5
40435	24.5N	44.4E	991	MS	57	0	0	2	1.3	7.8	7.9
40700	39.6N	47.9E	45	MS	109	0	0	0	0.8	-5.0	5.1
40713	37.4N	46.3E	1475	MS	112	26	23	0	0.9	13.6	13.6
40726	36.8N	45.7E	1384	MS	107	1	1	2	1.1	4.5	4.6
40741	36.5N	61.2E	235	MS	110	0	0	1	0.9	-4.6	4.7
40743	36.2N	57.7E	978	MS	115	0	0	1	1.0	4.6	4.7
40780	33.6N	46.4E	1362	MS	107	1	1	1	1.0	5.7	5.8
41254	23.1N	57.6E	1755	S8	112	112	100	0			
44416	28.6N	81.6E	720	MS	77	4	5	0	1.1	4.2	4.3
47022	40.8N	128.2E	1224	S	81	0	0	0	0.8	4.3	4.4
47678	33.1N	139.8E	79	MS	117	0	0	0	0.9	-8.6	8.6
48924	21.1N	101.5E	644	S	52	1	2	0	0.7	11.0	11.0
48925	20.7N	102.0E	550	S	53	2	4	0	1.0	-9.4	9.5
48938	19.2N	101.7E	326	MS	36	31	86	0	0.3	14.6	14.6
50727	47.2N	119.9E	1028	MS	117	0	0	0	0.8	4.7	4.8
50978	45.3N	130.9E	234	MS	117	0	0	0	0.7	-5.0	5.0
52866	36.6N	101.8E	2262	S	117	0	0	0	0.9	-4.2	4.3
53646	38.3N	109.8E	1058	MS	117	0	0	0	0.9	-11.1	11.1
56462	29.0N	101.5E	2994	S	117	0	0	0	1.0	8.8	8.9
56768	25.0N	101.5E	1773	S	117	0	0	0	0.5	-5.3	5.3
57816	26.6N	106.7E	1074	MS	117	33	28	0	0.4	-14.3	14.3
59663	21.8N	112.0E	22	MS	117	0	0	0	0.7	-6.7	6.7

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80434	9.2N	66.0W	125	MS	63	1	2	2	1.5	-4.7	4.9
82181	2.0S	54.1W	146	MS	74	0	0	0	0.7	4.9	4.9
82586	5.2S	39.3W	212	MS	87	1	1	0	0.8	-4.0	4.1
82704	7.6S	72.7W	170	MS	64	0	0	2	1.6	-4.8	5.1
83235	12.4S	46.4W	604	MS	88	1	1	1	0.7	6.5	6.5
83332	14.1S	46.4W	826	MS	87	8	9	0	0.6	13.9	13.9
83470	17.9S	50.9W	727	MS	87	1	1	1	0.8	-5.7	5.8
83531	18.6S	46.5W	940	MS	88	0	0	0	0.7	-7.1	7.1
83836	25.5S	50.6W	837	MS	87	0	0	0	0.8	-4.9	5.0
84401	5.2S	80.6W	49	MS	95	0	0	1	0.9	4.2	4.3
84425	5.9S	76.1W	179	MS	21	0	0	0	1.3	4.1	4.3

84455	6.5S	76.4W	281	MS	85	0	0	0	1.7	7.5	7.7
84472	7.1S	78.5W	2620	S	40	0	0	0	0.7	-5.2	5.2
84474	7.2S	76.7W	350	S	21	0	0	0	1.1	9.2	9.3
84501	8.1S	79.0W	26	MS	84	0	0	0	0.7	4.2	4.3
84688	13.7S	73.4W	3444	S	34	0	0	0	0.5	-12.3	12.3
84720	14.9S	75.0W	567	MS	38	1	3	0	0.7	4.4	4.5
84782	18.1S	70.3W	468	MS	84	0	0	11	1.5	5.3	5.5
85140	14.3S	67.4W	140	MS	57	0	0	2	1.6	6.3	6.5
85312	19.8S	63.9W	992	S	45	8	18	9	1.2	-12.7	12.8
85432	22.5S	68.9W	2320	S8	80	0	0	0	0.8	4.3	4.4

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71060	52.5N	116.1W	230	MS	102	102	100	0			
71181	47.1N	55.3W	29	MS	115	0	0	0	0.6	-5.7	5.7
71619	48.0N	65.3W	46	MS	276	159	58	0	1.1	0.3	1.1
72327	36.1N	86.7W	182	MS	114	0	0	0	0.7	4.0	4.1
76055	31.0N	114.9W	440	MS	57	57	100	0			
76160	29.1N	110.9W	212	MS	21	0	0	0	0.9	-4.0	4.1
76225	28.6N	106.1W	1435	MS	71	1	1	1	0.7	-4.4	4.5
76543	22.0N	98.8W	104	MS	83	0	0	0	0.5	9.3	9.3
76658	19.2N	103.7W	494	MS	47	1	2	2	0.8	5.7	5.8
76687	19.5N	96.9W	1389	MS	89	0	0	13	0.6	4.0	4.0
76762	17.5N	99.5W	1265	MS	85	1	1	0	0.7	5.8	5.8
76773	17.8N	97.8W	1650	MS	22	0	0	0	0.5	5.8	5.8
76843	16.8N	93.1W	528	MS	101	0	0	60	0.8	-4.8	4.9
78588	17.2N	87.5W	-288	M	108	108	100	0			
78655	14.0N	89.6W	725	MS	43	0	0	0	0.6	11.5	11.5

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94130	14.8S	131.9E	120	MS	117	0	0	0	1.1	5.4	5.5
94146	23.1S	135.6E	18	MS	57	0	0	53	3.4	-6.4	7.2
97378	10.7S	123.1E	1	MS	23	22	96	0	0.0	-4.3	4.3
98851	6.1N	125.2E	14	S	102	6	6	75	5.7	-10.3	11.8

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01280	64.3N	11.2E	86	MS	83	0	0	1	1.1	-4.0	4.1
01360	61.9N	7.9E	711	MS	87	0	0	0	0.5	5.4	5.4
06685	47.0N	9.1E	515	MS	117	0	0	2	1.0	6.0	6.1
06780	46.8N	9.8E	2690	S7	117	0	0	2	0.6	4.3	4.3
08912	42.9N	0.8W	1434	MS	99	99	100	0			
08922	42.8N	0.2W	1660	MS	98	98	100	0			
10850	48.8N	10.7E	457	MS	349	0	0	0	0.6	-5.3	5.3
13269	44.3N	19.9E	176	MS	106	0	0	1	0.7	7.4	7.4
14554	44.9N	18.4E	136	S	58	1	2	0	0.7	-13.0	13.0
16344	39.3N	16.4E	1710	S8	106	0	0	0	1.2	5.1	5.2
16538	40.1N	9.3E	1022	S	37	0	0	0	1.0	8.9	9.0
17088	40.5N	39.5E	1219	S8	86	0	0	0	1.4	5.4	5.6
17203	38.9N	40.5E	1177	S8	102	0	0	0	0.8	4.9	5.0
17521	35.2N	33.5E	285	MS	89	87	98	0	0.1	0.4	0.4

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	88	0	0	9	1.8	-7.5	7.7
89257	75.4S	59.9W	40	S	678	0	0	0	1.5	-7.6	7.7
89263	66.0S	66.1W	20	M	231	30	13	0	1.3	12.5	12.6
89264	71.4S	68.9W	780	S	116	0	0	0	1.4	6.6	6.7

89266	72.2S	60.2W	91	S	249	241	97	0	0.8	-13.7	13.7
89272	75.0S	70.8W	1395	S	251	251	100	0			
89512	70.8S	11.8E	140	MS	117	0	0	0	1.4	-4.1	4.3
89610	65.9S	113.1E	90	S	217	0	0	0	1.5	-8.1	8.2
89614	66.6S	111.2E	500	S	229	229	100	0			
89744	74.0S	43.1E	3353	S	270	0	0	0	0.7	7.6	7.6
89767	70.9S	69.9E	84	S	116	0	0	5	2.8	-5.2	5.9
89811	66.7S	112.8E	1366	S	230	0	0	0	1.7	-4.4	4.7

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	4316	1	44	1.4	0.1	4267	0	43	0	4.8	0.3
AAL	7752	0	38	1.3	0.1	7348	0	39	0	5.0	0.1
AAR	1414	1	5	1.5	-0.5	1395	0	6	0	7.3	0.2
ACA	2869	1	9	1.6	-0.1	2064	0	11	0	6.8	0.2
ACI	108	0	5	0.8	0.1	108	0	6	0	5.2	0.5
AEA	1625	1	3	1.5	0.0	1366	0	3	0	6.5	0.4
AEL	408	1	9	1.5	-0.2	381	0	9	0	7.1	0.2
AEW	48	0	0	1.6	-0.7	20	0	0	0	3.3	-0.3
AFL	826	1	5	2.2	0.1	433	0	3	0	7.4	0.2
AFR	1604	0	5	1.4	0.2	1568	0	7	0	7.0	0.3
AJM	444	0	2	1.3	-0.2	381	0	2	0	7.0	0.9
AJX	264	0	2	1.5	1.0	264	0	3	0	6.5	0.0
AMT	2047	1	45	1.1	0.0	2027	0	45	0	5.3	0.0
AMX	509	2	4	1.4	0.2	471	0	5	0	8.7	-0.2
ANA	52	2	2	1.7	0.3	53	0	2	0	7.4	0.9
ANZ	5327	0	26	1.3	0.2	5315	0	26	0	6.4	0.3
ARG	46	0	9	2.0	-0.1	33	0	12	0	8.2	1.0
ATN	162	0	100	3.1	-0.6	146	1	26	0	10.1	2.1
AVA	359	0	2	1.5	0.6	355	1	3	0	7.9	1.0
AVN	145	0	40	1.3	0.2	144	0	41	0	8.6	-0.3
AXF	30	0	23	1.0	-0.2	30	0	23	0	4.0	0.9
AZA	647	1	4	1.5	-0.1	541	0	4	0	6.6	0.0
BAL	409	0	8	1.6	-0.1	389	0	10	0	8.0	0.5
BAW	590	1	15	1.9	-0.8	382	0	15	0	6.7	0.0
BBR	277	1	4	1.7	0.6	276	0	100	0	11.7	2.6
BHP	67	3	6	2.1	-1.3	50	0	0	0	5.0	-0.4
BPA	401	0	7	1.8	0.0	394	0	8	0	6.3	-0.2
BWA	369	1	5	1.5	0.1	337	0	5	0	6.7	0.5
CAL	80	1	6	2.1	0.0	88	0	6	0	7.7	0.5
CCA	421	1	16	2.3	0.5	432	0	100	0	9.0	0.0
CES	355	1	8	1.6	0.0	354	0	9	0	6.9	0.9
CFG	913	0	3	1.6	-0.1	764	0	5	0	7.2	0.6
CKK	120	0	10	1.8	0.3	130	0	13	0	10.4	0.9
CKS	390	2	28	1.9	-0.3	338	0	29	0	5.9	0.2
CLX	416	0	3	1.7	-0.5	258	0	4	0	6.1	-0.1
COA	277	1	46	1.6	-0.1	213	0	43	0	7.0	0.8
CPA	28	0	36	0.7	-0.3	28	0	39	0	11.7	-3.1
CRL	941	1	3	1.3	0.6	908	0	3	0	7.2	0.5
CSN	133	1	11	1.5	0.1	130	0	15	0	9.4	1.5
CUB	268	0	4	1.9	0.4	248	0	5	0	8.8	0.2
DAL	3629	0	38	1.2	0.1	3281	0	41	0	5.4	-0.1
DCE	98	2	8	1.8	1.1	96	0	8	0	7.5	2.3
DCS	36	0	14	1.8	-0.3	26	0	19	0	6.6	-0.3
DHL	114	2	100	6.4	-5.8	68	0	37	0	16.2	5.2
DLH	1141	1	14	1.8	-0.2	1038	0	16	0	7.6	0.5
DRD	204	3	7	2.0	0.4	200	0	6	0	9.4	-1.2
EDW	144	0	1	1.3	-0.1	131	0	5	0	7.8	-0.1
EEZ	100	1	4	1.5	-0.1	99	0	2	0	6.5	0.4
EIA	354	0	18	2.2	0.1	349	0	100	0	17.8	5.4
ELY	171	5	7	1.7	-0.3	121	0	2	0	6.3	0.2
ETH	31	0	10	1.2	0.3	30	0	10	0	4.8	-0.2
EVA	184	0	2	1.6	-0.4	190	0	7	0	7.9	-0.3
FCA	206	0	2	1.3	0.4	170	0	6	0	8.1	0.7
FDX	2036	1	48	1.4	0.3	1847	0	47	0	6.3	0.3
FIN	395	1	5	1.8	0.1	303	0	6	0	6.9	-0.7
FJI	866	2	30	1.6	0.9	848	0	30	0	8.3	0.0
FOM	826	0	27	1.4	-0.1	817	0	27	0	6.2	0.5
FWI	787	2	4	1.5	-0.1	794	0	5	0	8.1	0.0
GAF	49	2	10	2.0	-1.5	30	0	0	0	5.6	0.1

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GCO	210	0	14	1.4	0.0	205	0	23	0	10.7	2.4
GHA	119	2	6	1.6	-0.2	116	0	7	0	10.8	3.9
GRL	122	0	4	2.0	0.3	109	0	2	0	6.0	0.8
GTI	215	3	19	1.9	0.6	214	0	20	0	9.2	0.7
HAL	5301	0	42	1.5	0.5	5244	0	42	0	5.8	0.1
HXL	338	0	2	1.2	0.2	290	0	3	0	7.2	0.5
IBE	3802	1	4	1.4	0.3	3738	0	5	0	7.0	0.4
ICE	1263	0	4	1.7	0.0	812	0	3	0	5.9	0.3
ISR	43	2	5	1.1	-0.3	29	0	3	0	5.7	1.4
IWD	654	1	3	1.3	0.2	647	0	4	0	6.9	0.4
JAL	2857	0	3	1.7	0.7	2804	0	4	0	7.7	0.2
JAZ	638	0	2	1.4	0.9	624	0	3	0	6.7	0.1
JBU	74	0	3	1.5	0.4	76	0	3	0	6.0	1.9
KAL	2198	0	8	1.7	0.0	2198	0	9	0	7.9	0.4
KLM	1566	0	3	1.7	0.0	1179	0	5	0	6.5	0.6
LAN	457	0	4	1.4	-0.2	457	0	4	0	4.9	0.9
LAP	85	0	44	2.2	0.6	84	0	45	0	7.9	1.0
LDI	408	1	4	1.4	0.2	350	0	5	0	7.5	0.1
LNE	136	1	2	1.5	0.5	136	0	6	0	10.3	1.3
LOT	254	1	4	2.2	-0.6	172	0	3	0	5.9	0.7
LTU	1046	1	5	1.4	-0.1	867	0	5	0	7.7	0.6
LXJ	29	0	52	2.4	-0.8	29	0	48	0	4.3	1.4
LXR	143	0	6	1.4	0.0	124	0	5	0	7.2	0.6
MAS	346	0	4	1.4	0.0	337	0	4	0	5.8	0.4
MMZ	96	0	8	2.1	1.0	99	1	16	0	11.1	0.2
MON	93	1	4	1.5	0.2	80	1	5	0	7.4	0.2
MPD	524	0	3	1.6	0.4	491	0	3	0	6.5	0.5
MPH	715	0	3	1.7	-0.8	533	0	3	0	5.8	0.2
MXA	141	1	16	2.8	0.7	139	1	15	0	13.0	-2.6
MYT	416	0	7	1.6	0.0	303	0	8	0	8.5	-0.2
NAO	611	0	35	1.2	0.3	602	0	37	0	5.9	-0.2
NCA	1045	0	4	2.0	0.5	761	0	5	0	7.0	0.3
NWA	8278	0	13	1.6	0.2	8126	0	14	0	7.1	0.2
NZL	3634	0	8	1.2	0.0	3634	0	8	0	4.5	0.4
OAE	758	0	35	1.1	-0.3	683	0	43	0	9.2	1.1
OOM	177	1	6	2.0	-1.3	111	0	6	0	5.4	0.0
PAC	578	1	15	1.5	0.0	524	0	17	0	7.6	0.0
PAL	1567	1	10	1.5	0.1	1468	0	11	0	7.8	0.5
PAO	286	1	43	1.2	0.2	286	1	44	0	6.6	0.3
PBI	489	1	27	1.6	-0.1	488	0	26	0	4.5	0.3
PLM	455	0	3	1.5	0.8	372	0	3	0	6.5	0.6
PUA	47	0	53	1.9	-0.3	43	0	65	0	19.2	7.8
QFA	4317	0	44	1.4	0.3	4313	0	44	0	5.6	-0.1
QQA	31	0	39	0.9	0.3	31	0	39	0	3.7	0.0
RAM	480	0	2	1.6	0.7	385	0	36	0	8.7	0.0
RCH	207	1	100	3.3	-1.5	170	0	100	0	14.7	1.7
RRR	106	2	12	2.1	0.0	99	0	14	0	8.1	1.8
RYN	43	0	44	0.8	-0.5	43	0	47	0	6.2	0.2
RZO	1242	1	5	1.6	-0.5	1185	0	5	0	8.1	0.3
SAA	109	0	4	1.0	-0.1	104	1	5	0	4.9	0.2
SCY	41	0	10	2.3	0.7	39	0	10	0	6.6	0.8
SEU	249	1	3	1.3	0.2	235	0	4	0	6.1	0.7
SIA	365	0	1	1.4	0.3	367	0	1	0	4.5	0.2
SLM	52	0	8	1.1	0.2	51	0	6	0	5.6	-0.6
SOO	29	3	7	2.0	0.8	46	2	9	0	9.3	2.5
SQC	36	0	0	1.4	0.4	36	0	0	0	5.6	-0.6
SSV	62	0	8	1.8	-0.3	42	0	14	0	11.9	0.1
SVH	445	0	8	1.1	0.9	445	0	8	0	3.4	-0.1
TAG	37	0	5	2.4	-0.7	25	0	8	0	6.1	-0.6

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TAM	43	0	37	2.8	0.1	43	0	37	0	11.0	3.9
TAP	973	1	2	1.3	-0.4	918	0	2	0	6.7	0.4
TCX	95	0	1	1.3	0.3	58	0	7	0	9.7	-1.3
THA	178	0	4	1.4	-0.1	175	0	5	0	5.3	0.2
THT	894	0	22	1.1	0.6	890	0	22	0	5.3	1.0
TPA	35	0	0	0.7	0.2	28	0	0	0	3.9	0.0
TSC	435	0	3	1.7	-0.4	308	0	3	0	6.8	0.7
UAE	573	0	4	1.2	0.2	573	0	4	0	3.8	0.3
UAL	201313	0	93	1.0	-0.1	201392	0	93	0	4.8	0.2
UPS	2026	0	58	1.4	0.0	1983	0	59	0	7.2	0.1
USA	66	2	3	1.4	0.4	64	0	0	0	4.6	1.8
VHF	30	3	3	1.0	0.0	30	0	0	0	5.2	0.4
VIR	250	2	4	1.7	0.0	146	0	3	0	7.6	0.7
VRG	128	5	52	2.8	0.3	127	1	100	0	12.9	4.8
VVJ	39	0	21	2.0	-0.2	39	0	18	0	5.7	0.7
VVR	71	0	31	2.2	1.1	70	0	29	0	4.8	0.2
WOA	439	1	11	1.6	0.2	387	1	13	0	8.1	0.7
XLA	135	0	1	0.9	0.2	134	0	4	0	6.7	0.9
YSS	125	1	2	1.3	0.8	124	0	2	0	6.1	0.9

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	37199	0	9	1.3	0.6	37214	0	9	0	5.0	0.6
EU	207890	0	25	1.3	0.4	207888	0	25	0	4.5	0.2
HK	621	0	24	1.3	0.8	621	0	24	0	5.1	0.6
KL	1731	0	1	2.0	1.6	1731	0	1	0	6.7	-0.2
LN	49	2	59	3.5	-2.7	52	0	52	0	13.2	5.8
MK	2697	0	6	1.6	1.4	2644	0	6	0	6.7	1.0
SA	4664	0	7	1.3	0.6	4664	0	8	0	7.1	0.8
TN	45	2	27	2.6	1.1	46	0	24	0	6.7	0.2

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	1055	1	24	2.3	0.5	865	0	27	0	7.2	0.8
US ACARS	931463	0	62	1.2	0.5	931457	0	61	0	5.2	0.6

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:1000.0 – 300.1 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

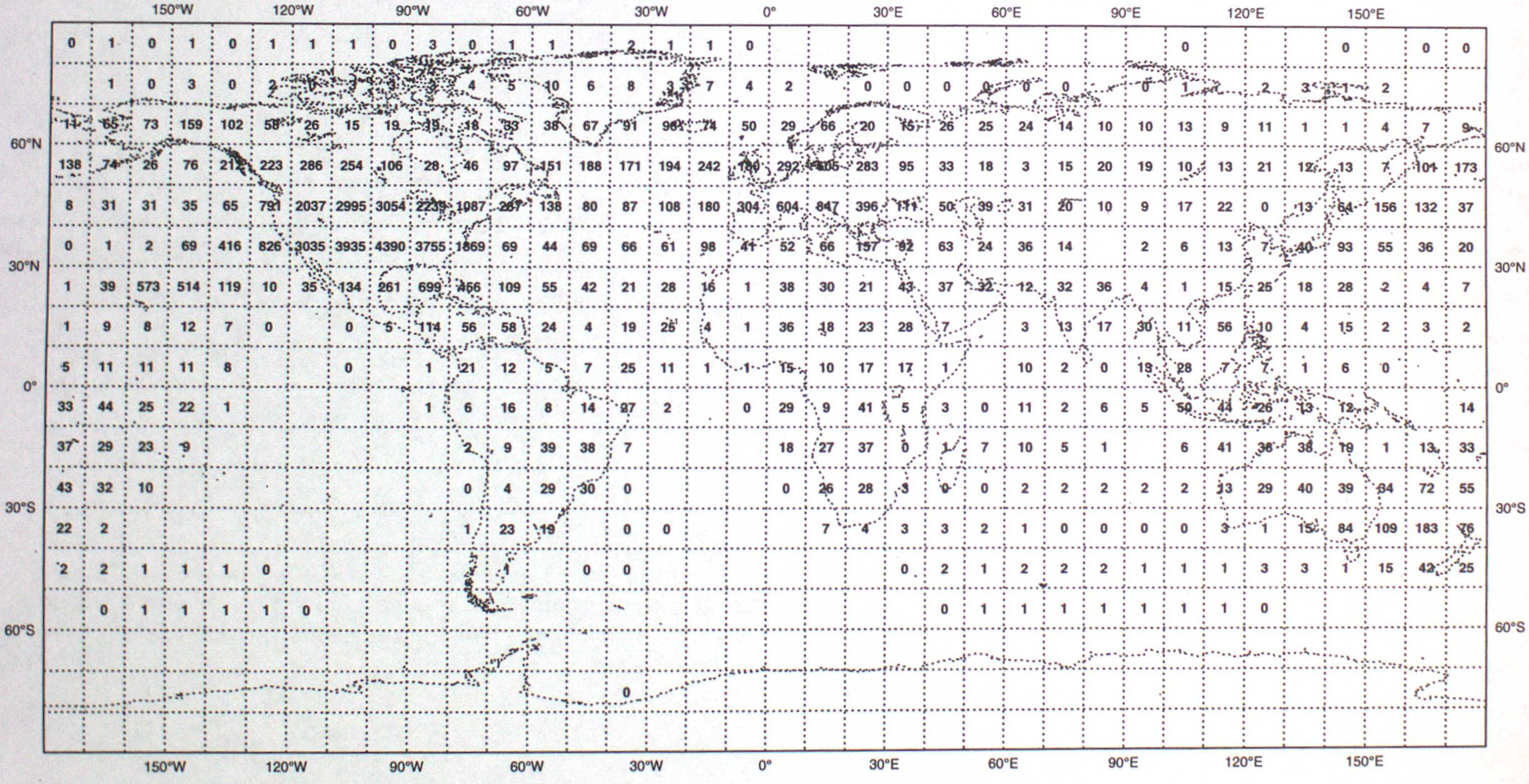
		TEMPERATURE					WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	199	0	39	1.3	-0.1	177	0	42	0	4.4	1.2
ACA	53	0	28	2.4	0.3	48	0	27	0	6.7	1.4
AFR	73	3	4	1.2	0.0	78	0	1	0	5.9	0.8
AMT	31	0	19	1.6	0.8	31	0	26	0	9.3	1.5
ANZ	218	0	20	1.4	-0.2	225	1	19	0	5.3	-0.4
ARG	26	4	15	3.6	0.5	24	0	13	0	12.0	5.4
AVN	27	0	41	1.6	-0.3	27	0	41	0	5.2	1.0
AXF	53	0	60	1.1	0.1	52	0	62	0	6.4	0.0
AZA	31	6	6	1.2	-0.3	32	0	9	0	9.8	1.6
BAL	34	3	9	1.2	-0.5	34	0	6	0	5.6	1.5
CFC	36	3	17	2.5	0.2	24	0	13	0	4.2	0.3
CFG	27	0	0	1.4	-0.3	20	0	10	0	7.6	2.3
CRL	32	0	0	1.6	0.7	31	0	3	0	5.8	1.8
DAL	125	0	42	1.5	0.5	117	0	43	0	4.9	0.6
DLH	296	1	15	1.9	-0.1	287	0	15	0	7.8	0.8
EIA	33	0	12	2.5	1.5	32	0	100	0	19.6	13.1
FDX	409	0	28	1.5	0.4	326	0	27	0	7.8	0.5
FXI	30	3	30	4.4	3.2	28	0	4	0	8.0	2.2
GAF	61	0	5	1.1	0.1	24	0	4	0	12.6	-0.7
GCO	103	1	12	1.5	0.3	105	0	26	0	14.1	2.7
GHA	21	10	10	1.2	0.1	20	0	5	0	9.3	1.2
HAL	167	1	42	1.9	0.4	161	0	42	0	5.6	1.4
IBE	24	4	13	1.5	0.0	24	0	13	0	11.5	-3.0
ICE	58	0	0	1.5	-0.6	34	0	3	0	8.2	0.4
JAL	49	0	0	1.5	1.0	48	0	0	0	5.8	-0.4
KAL	49	0	20	1.2	-0.3	50	0	22	0	6.6	1.3
KIW	34	15	50	3.0	-0.1	34	0	41	0	8.7	-0.8
KLM	48	2	10	1.3	-0.2	44	0	9	0	5.4	0.3
LAN	46	4	13	2.6	-1.1	46	2	13	0	11.8	2.8
MAS	33	0	15	1.0	-0.1	34	0	15	0	4.1	1.5
MPH	82	0	5	1.9	-1.0	51	0	2	0	7.1	2.8
NCA	102	2	4	1.6	0.7	87	0	6	0	9.3	-1.5
NWA	440	0	7	1.4	0.3	421	0	7	0	6.6	-0.7
NZL	17680	0	52	1.0	0.2	17680	0	52	0	4.2	0.4
OAE	69	0	9	1.3	0.1	45	0	38	0	18.7	3.0
OCE	33	0	9	2.4	1.7	30	0	7	0	3.5	0.2
PAC	45	2	7	1.6	-0.2	42	0	0	0	6.1	0.5
PAL	30	0	10	1.0	0.1	27	0	19	0	5.3	1.2
QFA	300	1	46	1.3	0.1	300	0	45	0	5.3	0.1
RCH	34	6	100	2.6	0.2	25	0	100	0	9.2	0.0
RRR	174	6	18	2.2	0.5	172	0	13	0	8.8	0.0
SIA	58	0	3	1.2	0.6	58	0	3	0	4.6	0.7
SVH	17783	0	59	1.5	0.5	17783	0	59	0	4.4	0.4
THT	29	0	24	0.8	0.0	29	0	24	0	3.9	0.6
UAE	87	0	0	1.3	0.4	87	0	0	0	5.7	0.7
UAL	351494	0	99	1.1	-0.1	351078	0	99	0	4.0	0.4
UPS	177	1	45	1.6	0.1	173	0	45	0	7.7	0.1
VVR	33	6	27	3.1	-2.2	41	0	5	0	3.7	0.7
WOA	163	1	6	1.1	0.3	119	0	18	0	12.2	1.8

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	29283	0	48	1.1	0.5	29330	0	48	0	4.2	0.1
EU	575939	0	66	1.1	0.2	571661	0	66	0	3.8	0.0
HK	830	0	75	1.3	0.1	830	0	74	0	3.9	0.2
KL	457	0	60	1.7	0.1	457	0	60	0	5.2	-0.1
MK	2401	0	49	1.1	0.4	2380	0	49	0	4.4	0.8
SA	4071	0	58	1.4	0.2	4071	0	58	0	4.3	0.0

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	33	15	52	5.6	2.0	22	0	18	0	7.6	1.3
US ACARS	1642094	0	77	1.1	0.2	1637311	0	77	0	3.9	0.4

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. JULY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 47976



0	1	0	1	0	1	1	1	0	3	0	1	1		2	1	1	0											0				0		0	0
	1	0	3	0	2	0	3	3	3	4	5	10	6	8	3	7	4	2		0	0	0	0	0	0		0	1		2	3	1	2		
11	65	73	159	102	58	26	15	19	19	18	33	38	67	91	96	74	50	29	66	20	15	26	25	24	14	10	10	13	9	11	1	1	4	7	9
138	74	26	76	212	223	286	254	106	28	46	97	151	188	171	194	242	180	292	605	283	95	33	18	3	15	20	19	10	13	21	12	13	7	101	173
8	31	31	35	65	791	2037	2995	3054	2239	1087	287	138	80	87	108	180	304	604	847	396	111	50	39	31	20	10	9	17	22	0	13	64	156	132	37
0	1	2	69	416	826	3035	3935	4390	3755	1869	69	44	69	66	61	98	41	52	66	157	92	63	24	36	14		2	6	13	7	40	93	55	36	20
1	39	573	514	119	10	35	134	261	699	466	109	55	42	21	28	16	1	38	30	21	43	37	32	12	32	36	4	1	15	25	18	28	2	4	7
1	9	8	12	7	0		0	5	114	56	58	24	4	19	25	4	1	36	18	23	28	7		3	13	17	30	11	56	10	4	15	2	3	2
5	11	11	11	8			0		1	21	12	5	7	25	11	1	1	15	10	17	17	1		10	2	0	19	28	7	7	1	6	0		
33	44	25	22	1					1	6	16	8	14	27	2		0	29	9	41	5	3	0	11	2	6	5	50	44	26	13	12			14
37	29	23	9							2	9	39	38	7				18	27	37	0	1	7	10	5	1		6	41	36	38	19	1	13	33
43	32	10								0	4	29	30	0				0	26	28	3	0	0	2	2	2	2	2	13	29	40	39	64	72	55
22	2									1	23	19		0	0				7	4	3	3	2	1	0	0	0	0	3	1	15	84	109	183	76
2	2	1	1	1	0						1		0	0							0	2	1	2	2	2	1	1	1	3	3	1	15	42	25
	0	1	1	1	1	0																0	1	1	1	1	1	1	1	0					
														0																					

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. JULY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 85053

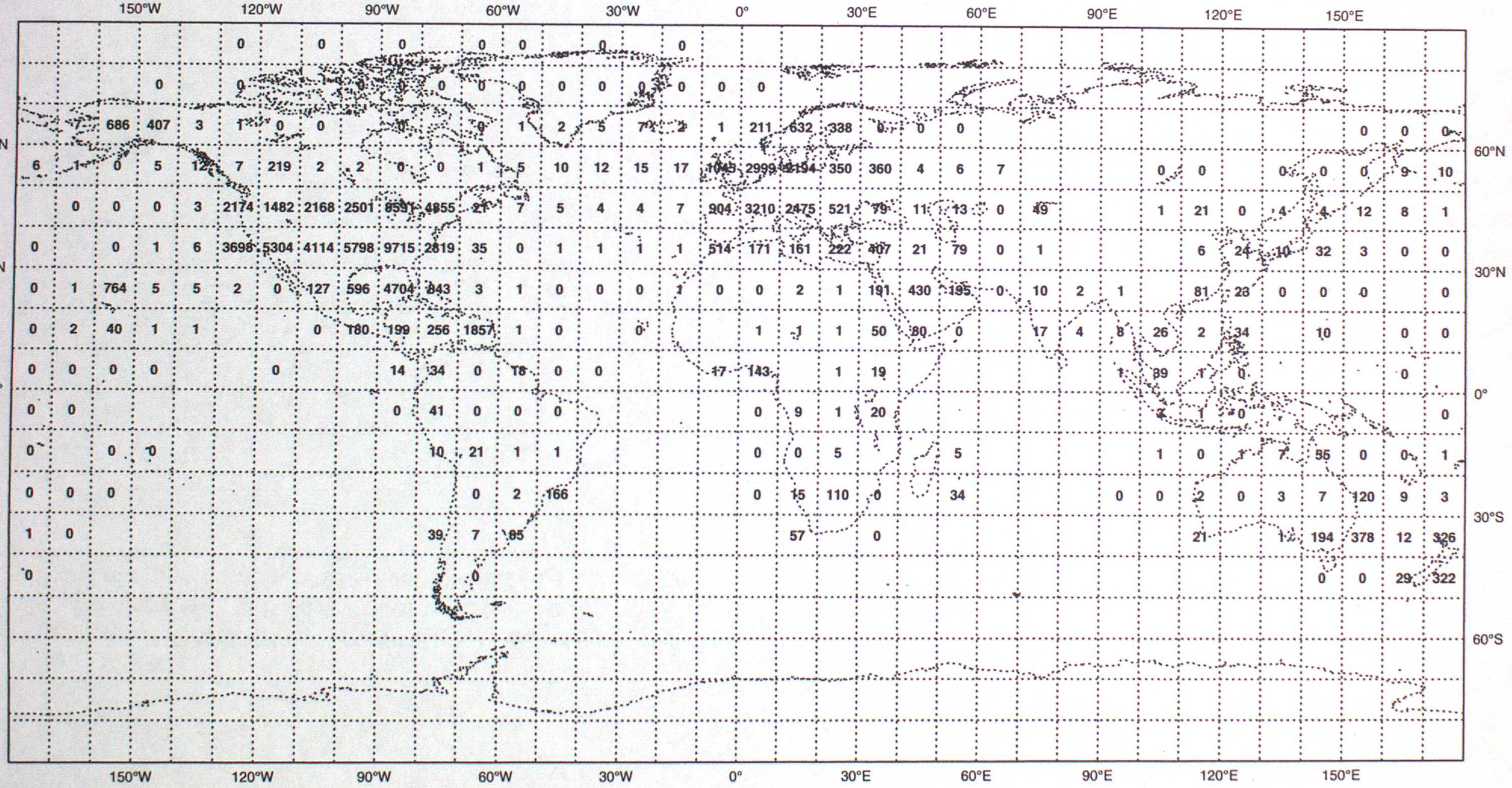

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0
7 686 407 3 1 0 0 0 0 1 2 5 7 2 1 211 632 338 0 0 0 0 0 0
6 1 0 5 12 7 219 2 2 0 0 1 5 10 12 15 17 1045 2999 3194 350 360 4 6 7 0 0 0 0 0 9 10
0 0 0 3 2174 1482 2168 2501 8591 4855 21 7 5 4 4 7 904 3210 2475 521 79 11 13 0 49 1 21 0 4 4 12 8 1
0 0 1 6 3698 5304 4114 5798 9715 2819 35 0 1 1 1 1 514 171 161 222 407 21 79 0 1 6 24 10 32 3 0 0
0 1 764 5 5 2 0 127 596 4704 843 3 1 0 0 0 1 0 0 2 1 191 430 195 0 10 2 1 81 28 0 0 0 0
0 2 40 1 1 0 180 199 256 1857 1 0 0 1 1 1 50 80 0 17 4 8 26 2 34 10 0 0
0 0 0 0 0 14 34 0 18 0 0 17 143 1 19 1 39 1 0 0
0 0 0 41 0 0 0 0 9 1 20 2 1 0 0
0 0 0 10 21 1 1 0 0 5 5 1 0 1 7 85 0 0 1
0 0 0 0 2 166 0 15 110 0 34 0 0 2 0 3 7 120 9 3
1 0 39 7 85 57 0 21 1 194 378 12 326
0 0 0 0 29 322

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. JULY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

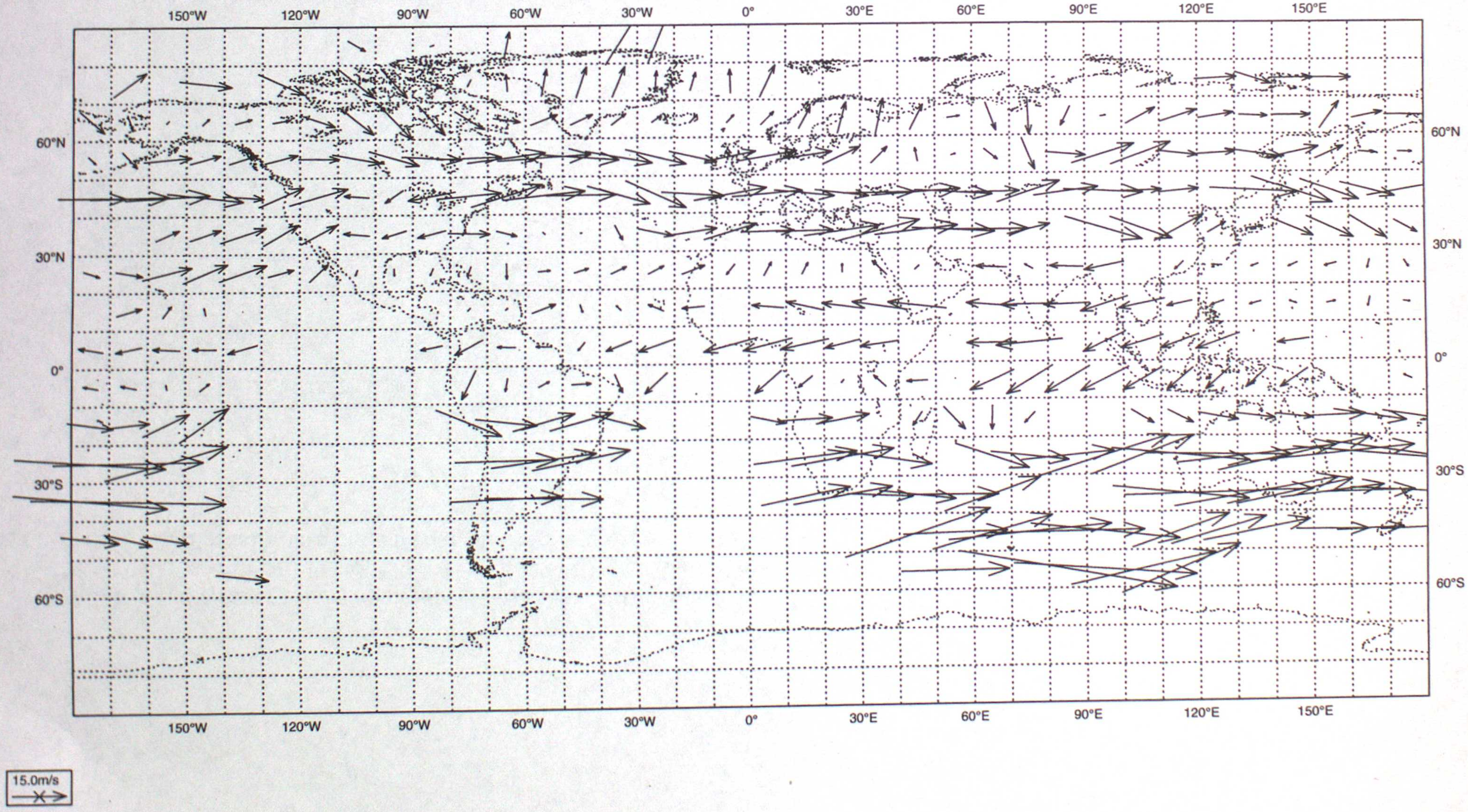

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. JULY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

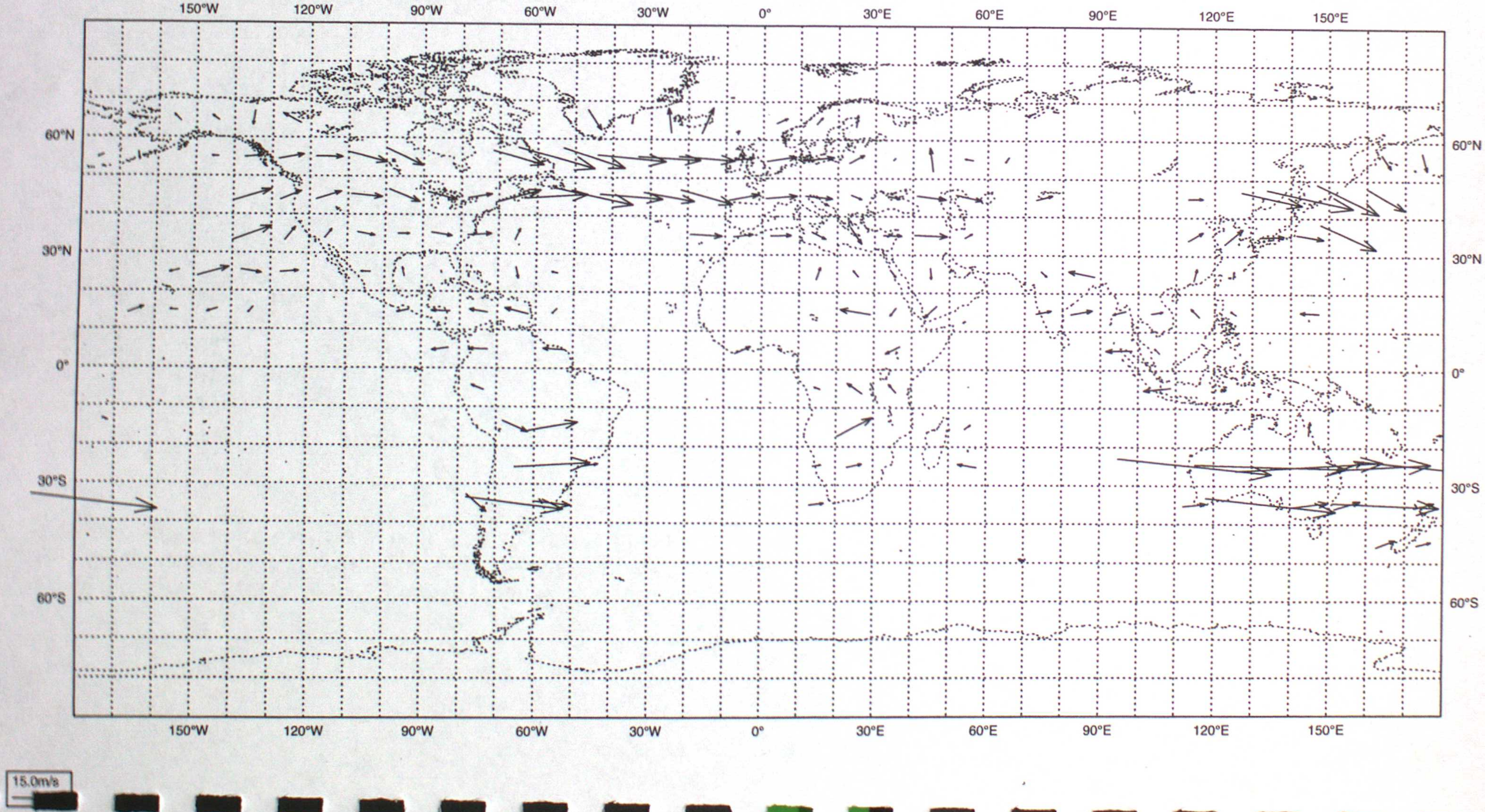
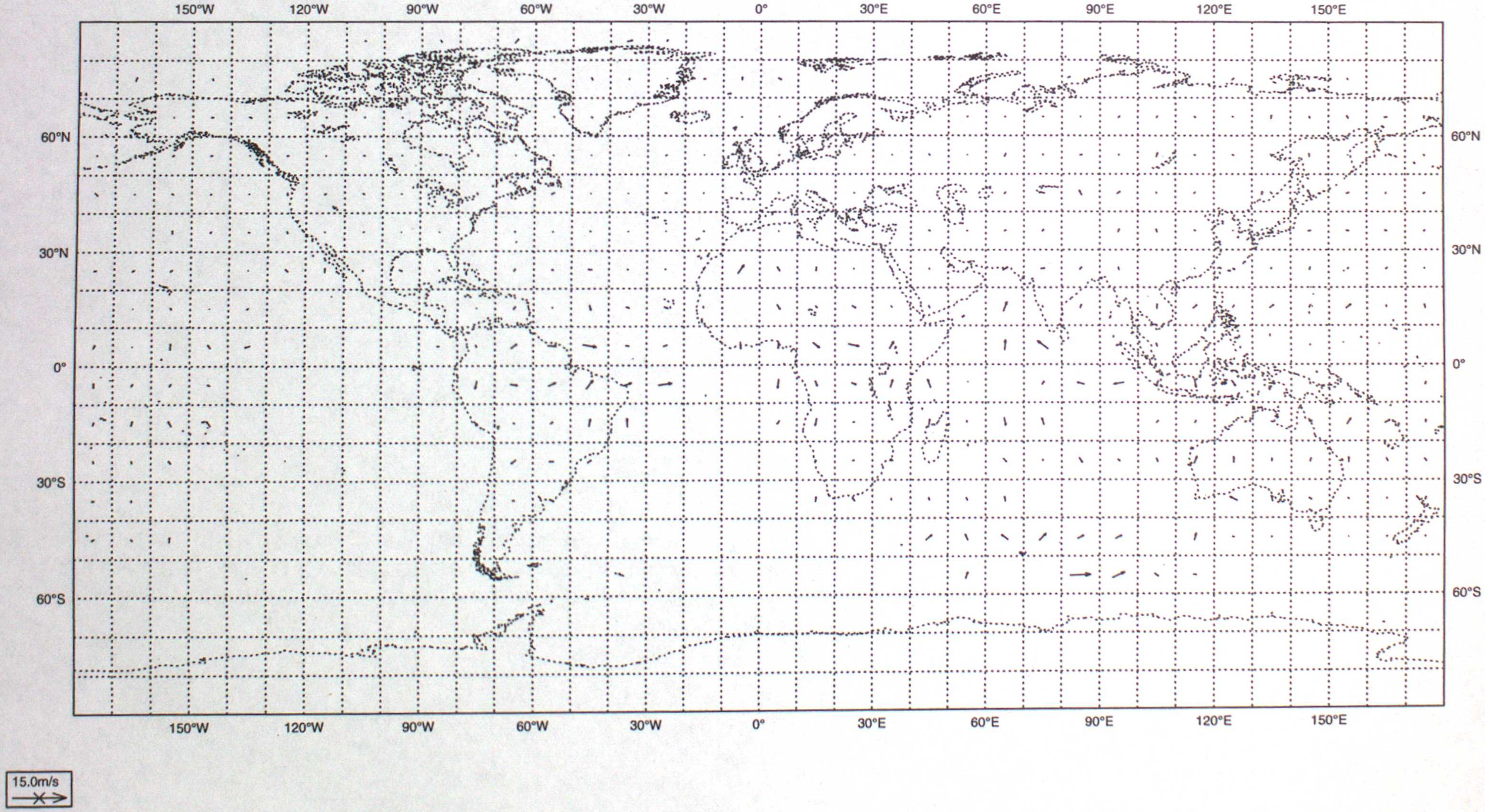

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. JULY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

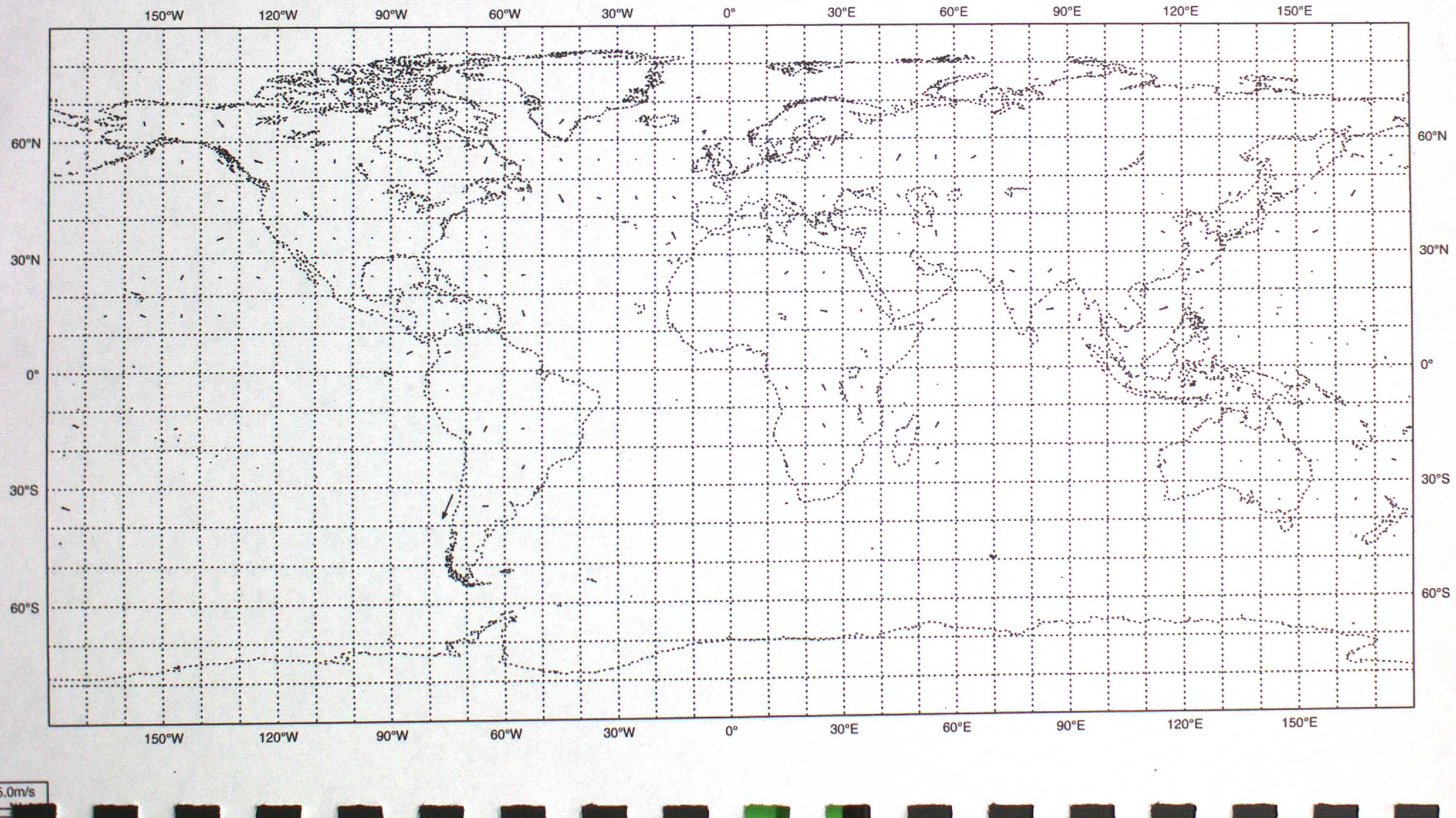


Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. JULY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). JULY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

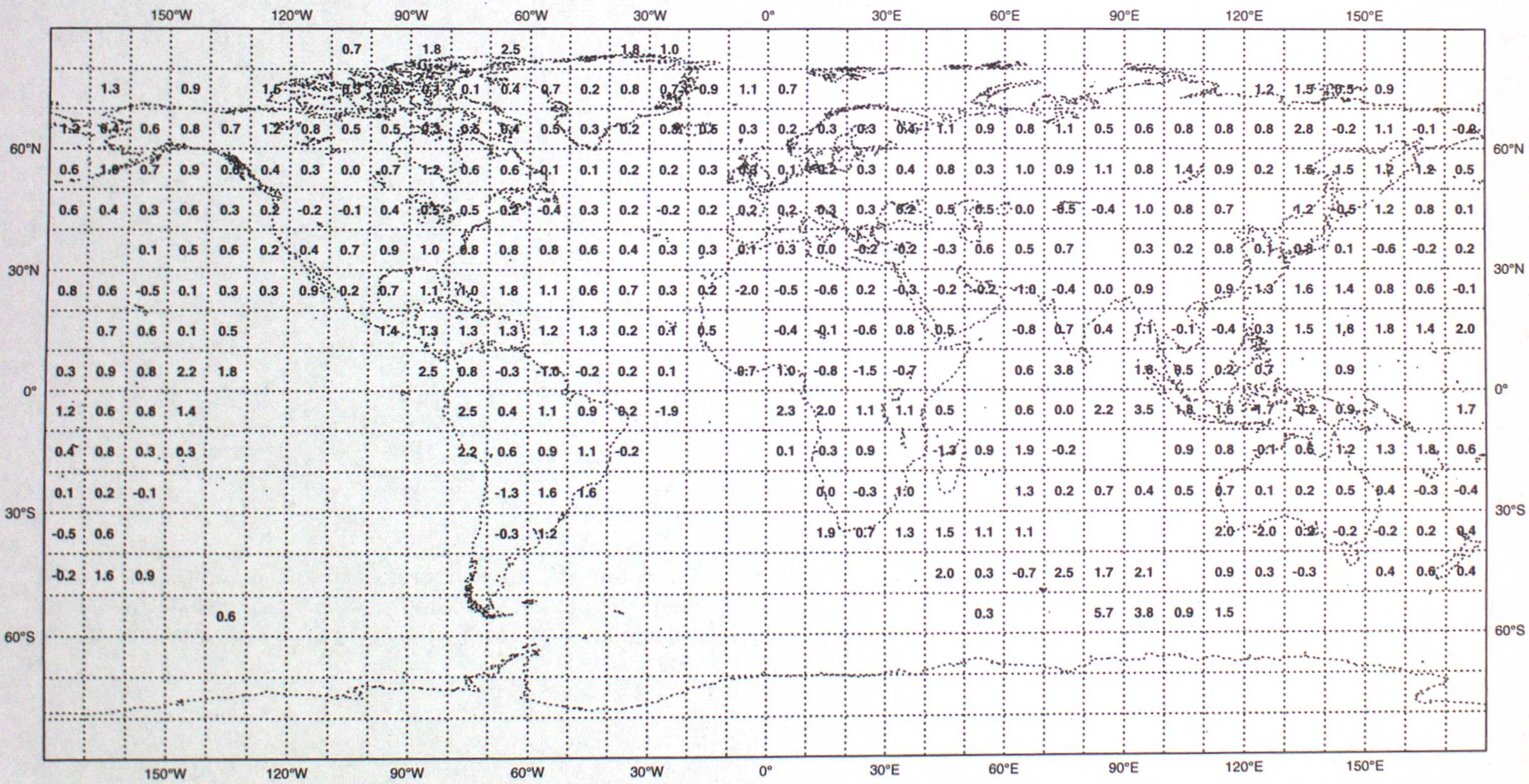

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0.7 1.8 2.5 1.8 1.0
1.3 0.9 1.5 0.5 0.5 0.1 0.1 0.4 0.7 0.2 0.8 0.7 0.9 1.1 0.7 1.2 1.5 0.5 0.9
1.2 0.4 0.6 0.8 0.7 1.2 0.8 0.5 0.5 0.3 0.5 0.4 0.5 0.3 0.2 0.8 0.5 0.3 0.2 0.3 0.3 0.4 1.1 0.9 0.8 1.1 0.5 0.6 0.8 0.8 0.8 2.8 -0.2 1.1 -0.1 -0.2
0.6 1.8 0.7 0.9 0.8 0.4 0.3 0.0 0.7 1.2 0.6 0.6 -0.1 0.1 0.2 0.2 0.3 0.3 0.1 0.2 0.3 0.4 0.8 0.3 1.0 0.9 1.1 0.8 1.4 0.9 0.2 1.6 1.5 1.2 1.2 0.5
0.6 0.4 0.3 0.6 0.3 0.2 -0.2 -0.1 0.4 0.5 0.5 0.2 -0.4 0.3 0.2 -0.2 0.2 0.2 0.2 0.3 0.3 0.2 0.5 0.5 0.0 -0.5 -0.4 1.0 0.8 0.7 1.2 0.5 1.2 0.8 0.1
0.1 0.5 0.6 0.2 0.4 0.7 0.9 1.0 0.8 0.8 0.8 0.6 0.4 0.3 0.3 0.1 0.3 0.0 -0.2 -0.2 -0.3 0.6 0.5 0.7 0.3 0.2 0.8 0.1 0.8 0.1 -0.6 -0.2 0.2
0.8 0.6 -0.5 0.1 0.3 0.3 0.9 0.2 0.7 1.1 1.0 1.8 1.1 0.6 0.7 0.3 0.2 -2.0 -0.5 -0.6 0.2 -0.3 -0.2 -0.2 -1.0 -0.4 0.0 0.9 0.9 1.3 1.6 1.4 0.8 0.6 -0.1
0.7 0.6 0.1 0.5 1.4 1.3 1.3 1.3 1.2 1.3 0.2 0.1 0.5 -0.4 -0.1 -0.6 0.8 0.5 -0.8 0.7 0.4 1.1 -0.1 -0.4 0.3 1.5 1.8 1.8 1.4 2.0
0.3 0.9 0.8 2.2 1.8 2.5 0.8 -0.3 -1.0 -0.2 0.2 0.1 -0.7 1.0 -0.8 -1.5 -0.7 0.6 3.8 1.8 0.5 0.2 0.7 0.9
1.2 0.6 0.8 1.4 2.5 0.4 1.1 0.9 0.2 -1.9 2.3 2.0 1.1 1.1 0.5 0.6 0.0 2.2 3.5 1.8 1.6 1.7 0.2 0.9 1.7
0.4 0.8 0.3 0.3 2.2 0.6 0.9 1.1 -0.2 0.1 -0.3 0.9 -1.3 0.9 1.9 -0.2 0.9 0.8 -0.1 0.6 1.2 1.3 1.8 0.6
0.1 0.2 -0.1 -1.3 1.6 1.6 0.0 -0.3 1.0 1.3 0.2 0.7 0.4 0.5 0.7 0.1 0.2 0.5 0.4 -0.3 -0.4
-0.5 0.6 -0.3 1.2 1.9 0.7 1.3 1.5 1.1 1.1 2.0 -2.0 0.2 -0.2 -0.2 0.2 0.4
-0.2 1.6 0.9 2.0 0.3 -0.7 2.5 1.7 2.1 0.9 0.3 -0.3 0.4 0.6 0.4
0.6 0.3 5.7 3.8 0.9 1.5

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). JULY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

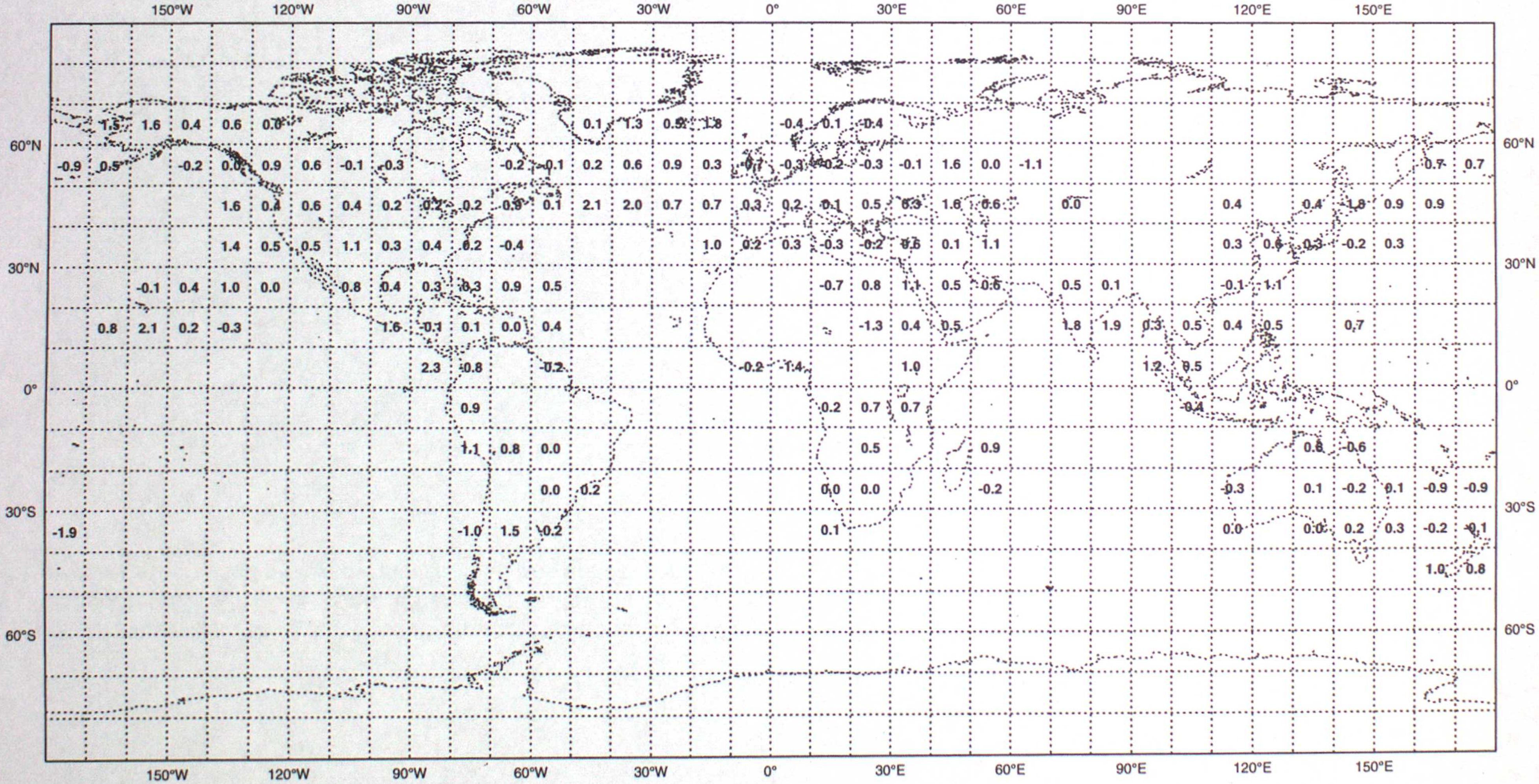

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1.5 1.6 0.4 0.6 0.6 0.1 1.3 0.5 1.8 -0.4 0.1 -0.4
-0.9 0.5 -0.2 0.0 0.9 0.6 -0.1 -0.3 -0.2 -0.1 0.2 0.6 0.9 0.3 -0.7 -0.3 -0.2 -0.3 -0.1 1.6 0.0 -1.1 -0.7 0.7
1.6 0.4 0.6 0.4 0.2 0.2 0.2 0.9 0.1 2.1 2.0 0.7 0.7 0.3 0.2 0.1 0.5 0.3 1.6 0.6 0.0 0.4 0.4 1.8 0.9 0.9
1.4 0.5 0.5 1.1 0.3 0.4 0.2 -0.4 1.0 0.2 0.3 -0.3 -0.2 0.6 0.1 1.1 0.3 0.6 0.3 -0.2 0.3
-0.1 0.4 1.0 0.0 0.8 0.4 0.3 0.3 0.9 0.5 -0.7 0.8 1.1 0.5 0.6 0.5 0.1 -0.1 1.1
0.8 2.1 0.2 -0.3 1.6 -0.1 0.1 0.0 0.4 -1.3 0.4 0.5 1.8 1.9 0.3 0.5 0.4 0.5 0.7
2.3 0.8 -0.2 -0.2 -1.4 1.0 1.2 0.5
0.9 0.2 0.7 0.7 -0.4
1.1 0.8 0.0 0.5 0.9 0.8 -0.6
0.0 0.2 0.0 0.0 -0.2 0.3 0.1 -0.2 0.1 -0.9 -0.9
-1.9 -1.0 1.5 0.2 0.1 0.0 0.0 0.2 0.3 -0.2 0.1
1.0 0.8

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). JULY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

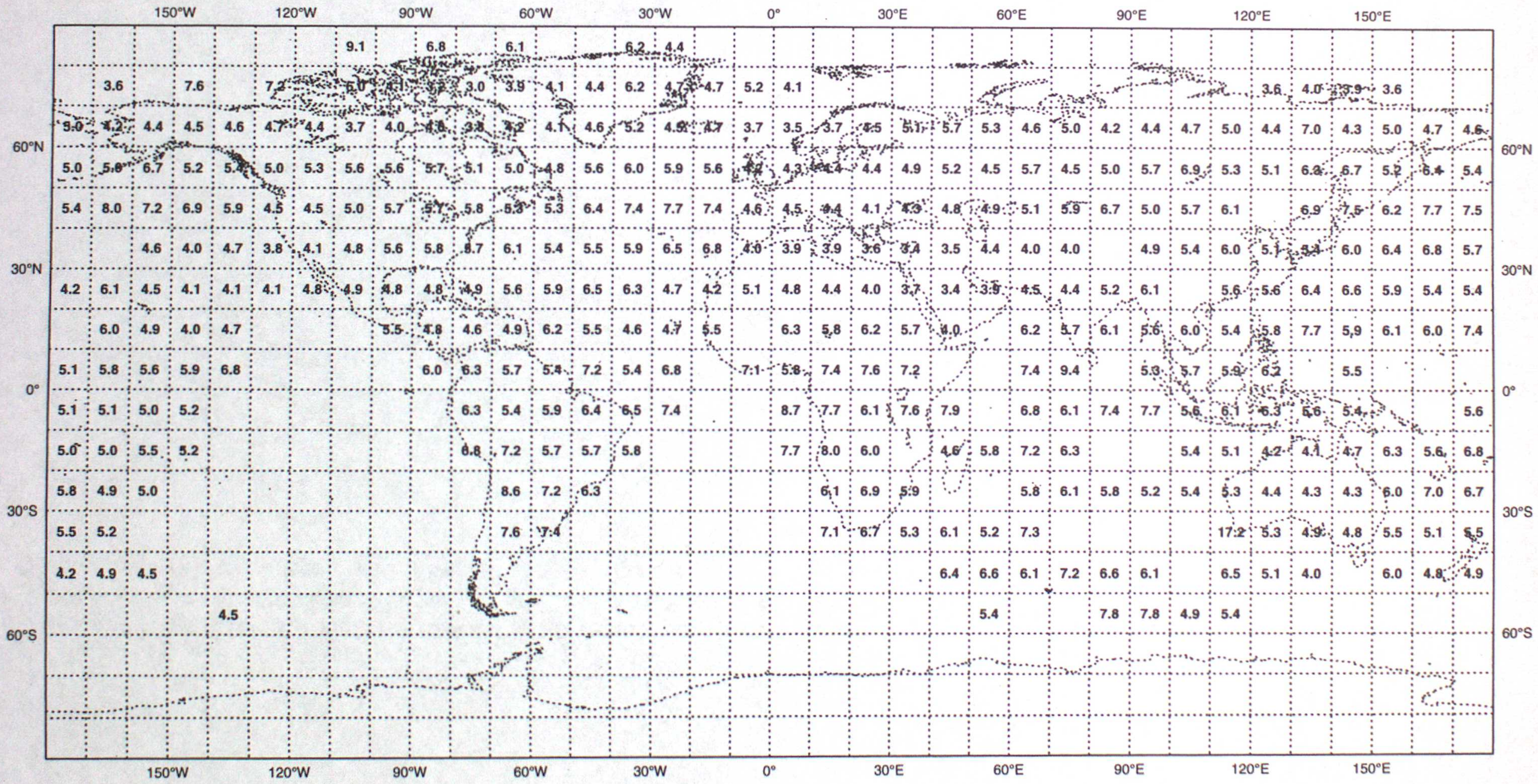

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
9.1 6.8 6.1 6.2 4.4
3.6 7.6 7.2 6.0 4.1 5.2 3.0 3.9 4.1 4.4 6.2 4.7 4.7 5.2 4.1 3.6 4.0 3.9 3.6
5.0 4.2 4.4 4.5 4.6 4.7 4.4 3.7 4.0 4.8 3.8 5.2 4.1 4.6 5.2 4.9 4.7 3.7 3.5 3.7 4.5 5.1 5.7 5.3 4.6 5.0 4.2 4.4 4.7 5.0 4.4 7.0 4.3 5.0 4.7 4.6
5.0 5.8 6.7 5.2 5.4 5.0 5.3 5.6 5.6 5.7 5.1 5.0 4.8 5.6 6.0 5.9 5.6 4.4 4.3 4.4 4.4 4.9 5.2 4.5 5.7 4.5 5.0 5.7 6.9 5.3 5.1 6.3 6.7 5.2 5.4 5.4
5.4 8.0 7.2 6.9 5.9 4.5 4.5 5.0 5.7 5.7 5.8 5.3 5.3 6.4 7.4 7.7 7.4 4.6 4.5 4.4 4.1 4.3 4.8 4.9 5.1 5.9 6.7 5.0 5.7 6.1 6.9 7.5 6.2 7.7 7.5
4.6 4.0 4.7 3.8 4.1 4.8 5.6 5.8 5.7 6.1 5.4 5.5 5.9 6.5 6.8 4.0 3.9 3.9 3.6 3.4 3.5 4.4 4.0 4.0 4.9 5.4 6.0 5.1 5.4 6.0 6.4 6.8 5.7
4.2 6.1 4.5 4.1 4.1 4.1 4.8 4.9 4.8 4.8 4.9 5.6 5.9 6.5 6.3 4.7 4.2 5.1 4.8 4.4 4.0 3.7 3.4 3.9 4.5 4.4 5.2 6.1 5.6 5.6 6.4 6.6 5.9 5.4 5.4
6.0 4.9 4.0 4.7 5.5 4.8 4.6 4.9 6.2 5.5 4.6 4.7 5.5 6.3 5.8 6.2 5.7 4.0 6.2 5.7 6.1 5.6 6.0 5.4 5.8 7.7 5.9 6.1 6.0 7.4
5.1 5.8 5.6 5.9 6.8 6.0 6.3 5.7 5.4 7.2 5.4 6.8 7.1 5.8 7.4 7.6 7.2 7.4 9.4 5.3 5.7 5.9 6.2 5.5
5.1 5.1 5.0 5.2 6.3 5.4 5.9 6.4 6.5 7.4 8.7 7.7 6.1 7.6 7.9 6.8 6.1 7.4 7.7 5.6 6.1 6.3 5.6 5.4 5.6
5.0 5.0 5.5 5.2 6.8 7.2 5.7 5.7 5.8 7.7 8.0 6.0 4.6 5.8 7.2 6.3 5.4 5.1 4.2 4.1 4.7 6.3 5.6 6.8
5.8 4.9 5.0 8.6 7.2 6.3 6.1 6.9 5.9 5.8 6.1 5.8 5.2 5.4 5.3 4.4 4.3 4.3 6.0 7.0 6.7
5.5 5.2 7.6 7.4 7.1 6.7 5.3 6.1 5.2 7.3 17.2 5.3 4.9 4.8 5.5 5.1 5.5
4.2 4.9 4.5 6.4 6.6 6.1 7.2 6.6 6.1 6.5 5.1 4.0 6.0 4.8 4.9
4.5 5.4 7.8 7.8 4.9 5.4

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). JULY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

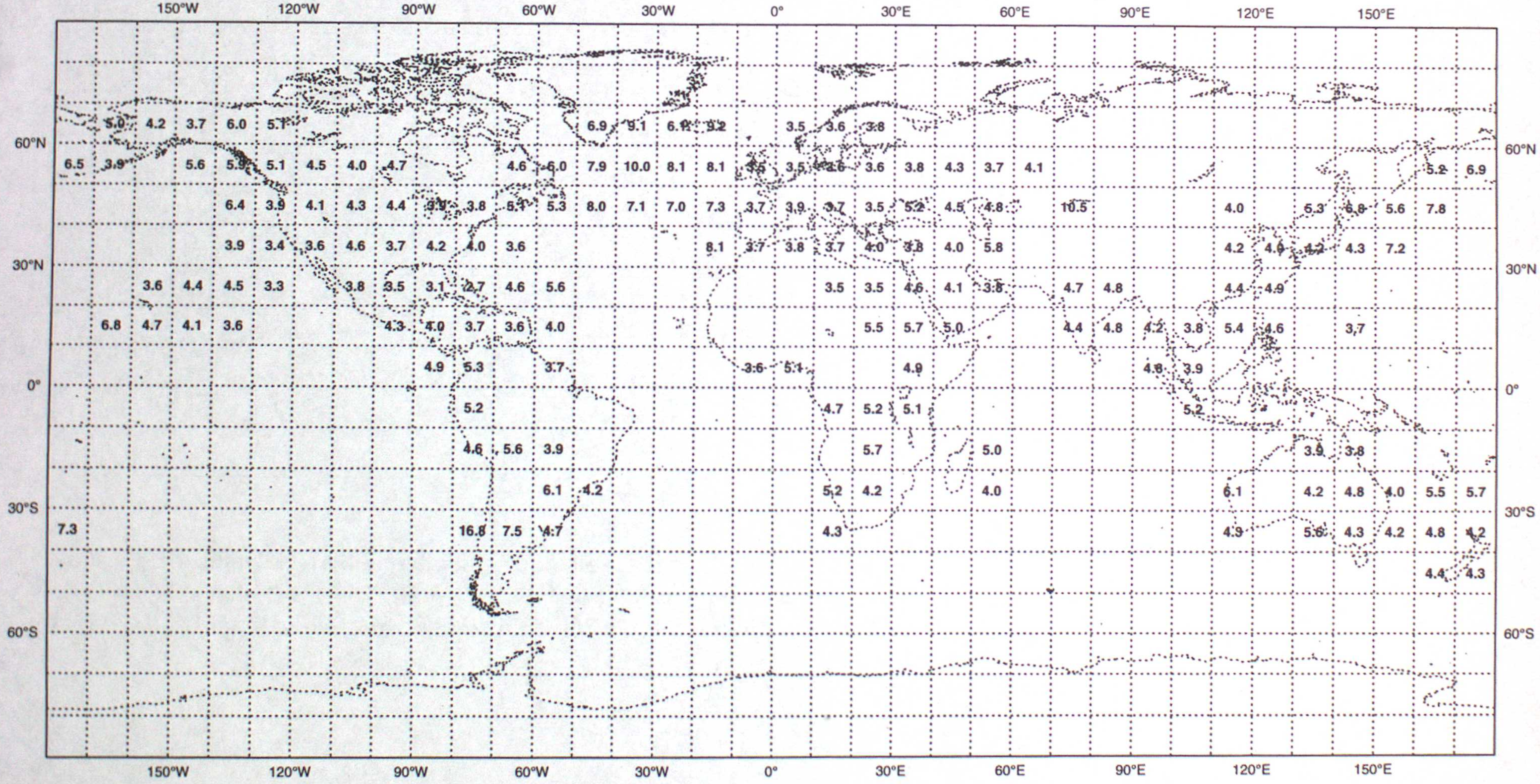

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
23418	00	Z	200	65/ 57	14	0	79.3	46.6	92.0	4
28225	00	Z	1000	58/ 56	18	8	23.7	-58.2	62.9	4
30054	12	Z	850	59/ 113	11	2	20.7	-52.2	56.1	7
35394	00	Z	70	50/ 73	27	0	33.5	144.0	147.9	4
42027	00	Z	200	34/ 75	17	0	64.8	-58.5	87.3	5
42101	00	Z	100	30/ 76	15	0	141.3	-55.6	151.9	8
42101	12	Z	50	30/ 76	9	1	183.0	85.3	201.9	9
42182	00	Z	200	29/ 77	14	2	122.8	-20.9	124.5	9
42182	12	Z	100	29/ 77	18	3	136.5	-88.5	162.7	10
42339	00	Z	200	26/ 73	15	1	64.4	-131.7	146.6	7
42339	12	Z	1000	26/ 73	1	19	0.0	63.0	63.0	9
42361	00	Z	200	26/ 78	9	1	121.7	-46.1	130.1	5
42361	12	Z	200	26/ 78	12	0	65.4	-113.4	130.9	5
42369	00	Z	200	27/ 81	16	1	85.4	-124.1	150.6	8
42369	12	Z	100	27/ 81	13	1	178.9	-19.8	179.9	9
42379	00	Z	200	27/ 83	12	0	68.4	-96.8	118.5	7
42379	12	Z	150	27/ 83	15	1	109.8	-107.3	153.5	8
42397	00	Z	200	27/ 88	10	1	91.9	-76.0	119.3	4
42410	00	Z	100	26/ 92	15	1	117.2	-90.1	147.9	5
42492	00	Z	1000	26/ 85	24	4	8.7	-81.3	81.8	7
42492	12	Z	1000	26/ 85	17	10	5.3	-88.2	88.3	4
42667	00	Z	200	23/ 77	11	0	90.4	-57.4	107.1	4
42701	00	Z	150	23/ 85	25	1	99.1	-66.4	119.3	7
42701	12	Z	200	23/ 85	12	1	75.0	-94.9	121.0	8
42809	00	Z	150	23/ 88	25	0	92.6	-79.0	121.7	6
42809	12	Z	100	23/ 88	13	1	99.1	-93.9	136.5	7
42867	00	Z	200	21/ 79	18	0	77.7	-82.9	113.7	8
42867	12	Z	100	21/ 79	11	1	146.0	-35.7	150.3	7
42874	00	Z	200	21/ 82	14	0	71.6	-89.2	114.4	5
42874	12	Z	200	21/ 82	12	0	76.8	-84.0	113.8	7
42971	00	Z	1000	20/ 86	27	0	18.7	-57.5	60.5	8
42971	12	Z	1000	20/ 86	28	1	16.9	-71.1	73.1	8
43003	00	Z	1000	19/ 73	9	19	2.8	-95.4	95.5	5
43003	12	Z	1000	19/ 73	8	22	2.3	-96.3	96.3	7
43014	00	Z	200	20/ 75	20	2	139.9	15.5	140.8	6
43014	12	Z	200	20/ 75	14	2	127.1	2.6	127.1	6
43128	00	Z	50	17/ 78	11	0	172.6	-52.5	180.4	7
43128	12	Z	70	17/ 78	10	0	110.6	142.1	180.1	4
43150	00	Z	150	18/ 83	10	1	93.1	-87.6	127.9	6
43150	12	Z	500	18/ 83	23	1	35.3	-57.1	67.2	7
43185	00	Z	1000	16/ 81	15	2	35.9	42.3	55.5	6
43185	12	Z	250	16/ 81	11	2	101.7	29.9	106.0	7
43192	00	Z	300	15/ 74	11	1	71.2	-71.5	100.9	4
43279	12	Z	1000	13/ 80	29	0	11.7	-59.5	60.6	6
43285	00	Z	150	13/ 75	13	0	87.6	-123.3	151.2	6
43295	00	Z	850	13/ 78	24	1	28.5	36.9	46.6	4
43333	00	Z	150	12/ 93	20	0	85.1	-146.3	169.2	6
43333	12	Z	150	12/ 93	23	0	134.6	-98.9	167.0	6
43346	12	Z	850	11/ 80	25	0	31.0	42.0	52.2	7
43353	00	Z	1000	10/ 76	24	3	7.6	-90.7	91.0	5
43371	00	Z	200	8/ 77	21	1	99.8	-82.0	129.1	10
43371	12	Z	150	8/ 77	23	1	124.1	6.8	124.3	7
58968	00	Z	1000	25/ 122	5	22	9.2	-91.6	92.1	4
89592	00	Z	50	-67/ 93	19	0	96.3	133.4	164.6	4

Figure 8. TEMP 500 hPa geopotential mean daily count. JULY 2004
All hours
Global average number of observations in 24 hours = 1147

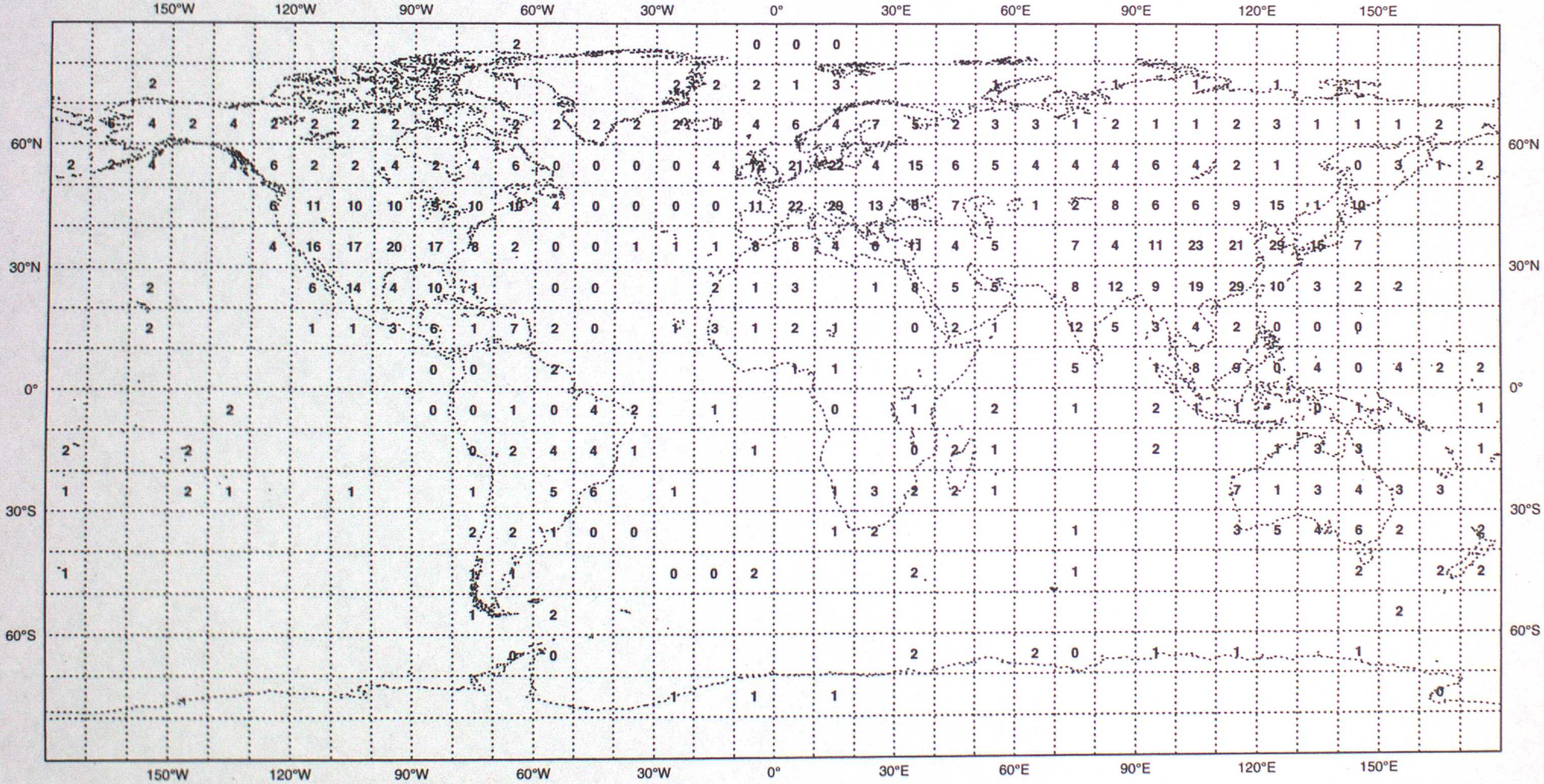

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
FQFL	12	V	250	-21/ -56	10	0	50	-19.7	7.3	34.2	5
43333	00	V	200	12/ 93	14	0	7	0.3	-2.2	16.0	1
43369	00	V	200	8/ 73	11	0	9	-0.2	7.0	21.1	1
43371	00	V	100	8/ 77	15	0	40	11.4	5.3	18.6	1
43371	12	V	100	8/ 77	18	0	16	7.9	2.3	15.5	1
47058	00	V	250	39/ 126	11	0	100	-0.9	-4.8	16.8	1
60360	12	V	100	37/ 8	14	0	100	14.9	-2.3	19.5	1
60566	12	V	150	32/ 4	11	0	100	-12.7	-5.7	20.8	3
61902	12	V	200	-8/ -14	16	0	25	8.9	5.2	16.3	2
63741	00	V	100	-1/ 37	25	0	28	12.4	2.1	17.0	1
63985	00	V	100	-5/ 55	28	0	21	12.4	4.4	20.9	1
63985	12	V	100	-5/ 55	26	0	15	12.2	4.3	18.3	1
64458	12	V	150	2/ 16	25	0	96	11.3	0.6	16.9	1
64910	12	V	150	4/ 10	21	0	100	11.0	0.0	15.4	1
68424	12	V	300	-28/ 21	14	0	100	-5.7	-1.2	19.9	2
68442	12	V	250	-29/ 26	18	0	100	-13.2	-0.2	21.7	2
68461	12	V	150	-28/ 28	13	0	100	2.4	7.4	26.2	4
68512	12	V	150	-30/ 18	21	0	100	-15.5	0.8	27.1	4
85442	12	V	150	-23/ -70	25	0	8	-2.4	0.7	25.5	1
96935	00	V	400	-7/ 113	13	0	15	-7.6	-2.0	18.0	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. JULY 2004
All hours
Global average number of observations in 24 hours = 1303

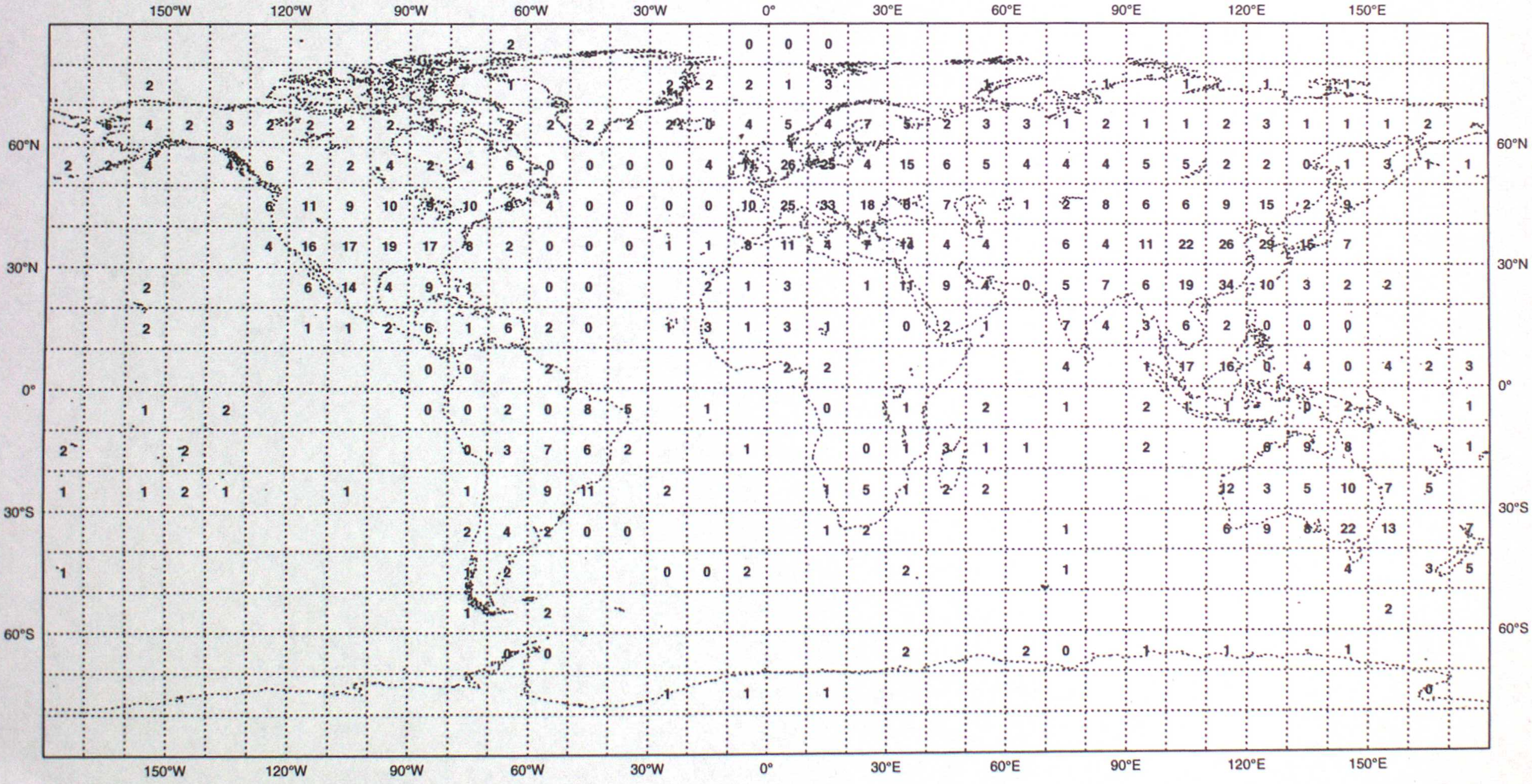

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Jul 04

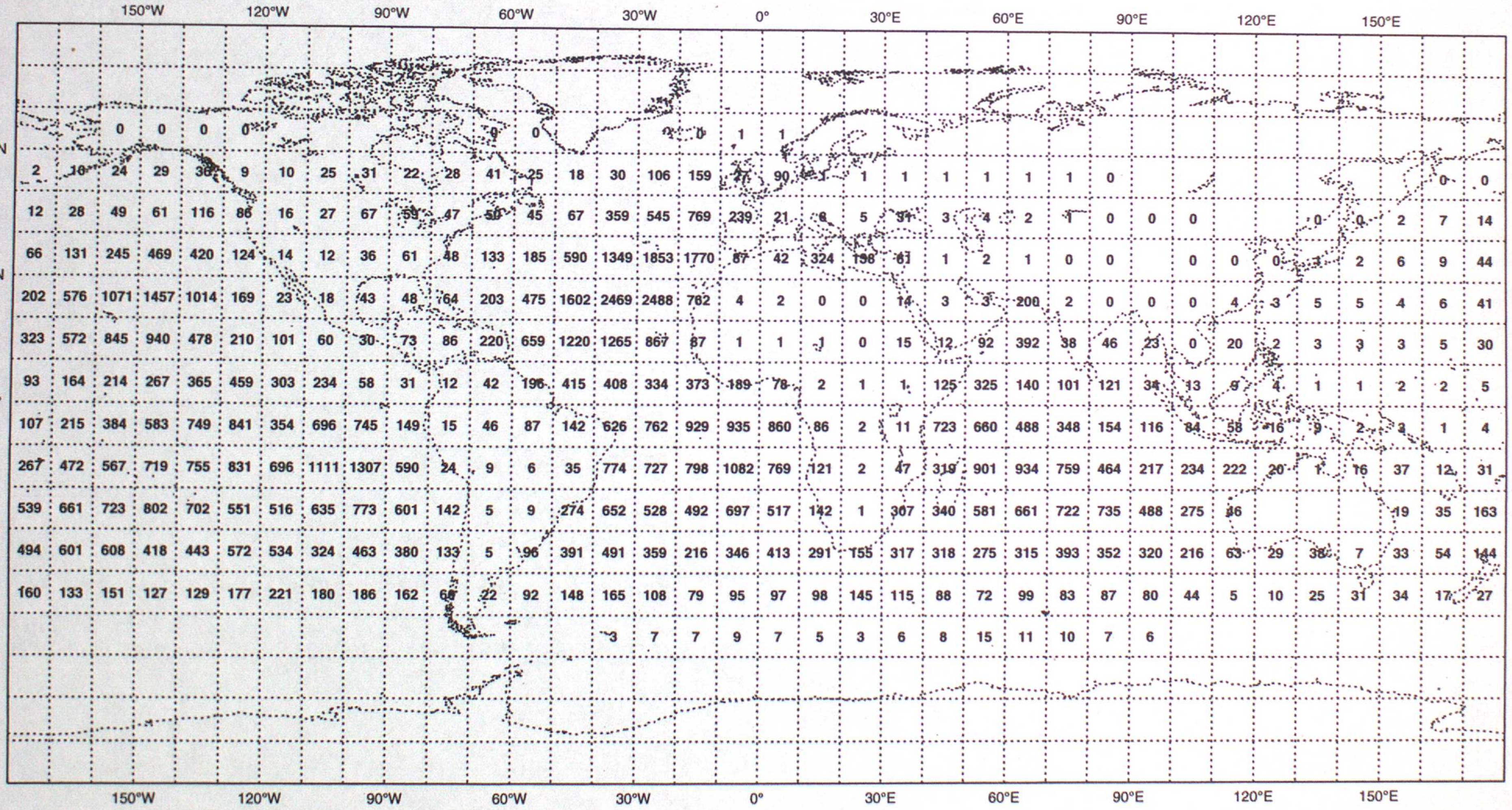
Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
33791	12	DD	48/ 33	23	-12.0	9.2	12.8
57993	00	DD	26/ 115	23	12.9	7.7	17.3
57993	12	DD	26/ 115	22	11.8	5.6	19.3
62337	00	DD	31/ 34	26	-20.7	3.1	9.0
72786	00	DD	48/-118	27	13.8	1.4	10.2
72786	12	DD	48/-118	28	11.5	2.3	11.1
78397	12	DD	18/ -77	7	10.3	9.7	19.6
78954	12	DD	13/ -59	13	-15.0	5.8	26.9
91366	12	DD	9/ 168	13	12.9	3.8	17.4

Figure 10. SATOB 701 - 1000 hPa mean daily count. JULY 2004
Global average number of observations in 24 hours = 94983



		0	0	0	0						0	0				0	1	1																	
2	16	24	29	36	9	10	25	31	22	28	41	25	18	30	106	159	27	90	1	1	1	1	1	1	1	0								0	0
12	28	49	61	116	86	16	27	67	59	47	50	45	67	359	545	769	239	21	6	5	31	3	4	2	1	0	0	0			0	0	2	7	14
66	131	245	469	420	124	14	12	36	61	48	133	185	590	1349	1853	1770	87	42	324	198	61	1	2	1	0	0		0	0	0	3	2	6	9	44
202	576	1071	1457	1014	169	23	18	43	48	164	203	475	1602	2469	2488	762	4	2	0	0	14	3	3	200	2	0	0	0	4	3	5	5	4	6	41
323	572	845	940	478	210	101	60	30	73	86	220	659	1220	1265	867	87	1	1	1	0	15	12	92	392	38	46	23	0	20	2	3	3	3	5	30
93	164	214	267	365	459	303	234	58	31	12	42	196	415	408	334	373	189	78	2	1	1	125	325	140	101	121	34	13	9	4	1	1	2	2	5
107	215	384	583	749	841	354	696	745	149	15	46	87	142	626	762	929	935	860	86	2	11	723	660	488	348	154	116	84	58	16	9	2	3	1	4
267	472	567	719	755	831	696	1111	1307	590	24	9	6	35	774	727	798	1082	769	121	2	47	319	901	934	759	464	217	234	222	20	1	16	37	12	31
539	661	723	802	702	551	516	635	773	601	142	5	9	274	652	528	492	697	517	142	1	307	340	581	661	722	735	488	275	46				19	35	163
494	601	608	418	443	572	534	324	463	380	133	5	96	391	491	359	216	346	413	291	155	317	318	275	315	393	352	320	216	63	29	36	7	33	54	144
160	133	151	127	129	177	221	180	186	162	68	22	92	148	165	108	79	95	97	98	145	115	88	72	99	83	87	80	44	5	10	25	31	34	17	27
														3	7	7	9	7	5	3	6	8	15	11	10	7	6								

Figure 11. SATOB 701 - 1000 hPa vector mean wind. JULY 2004
All observations
Arrows are plotted where greater than 10 obs are present

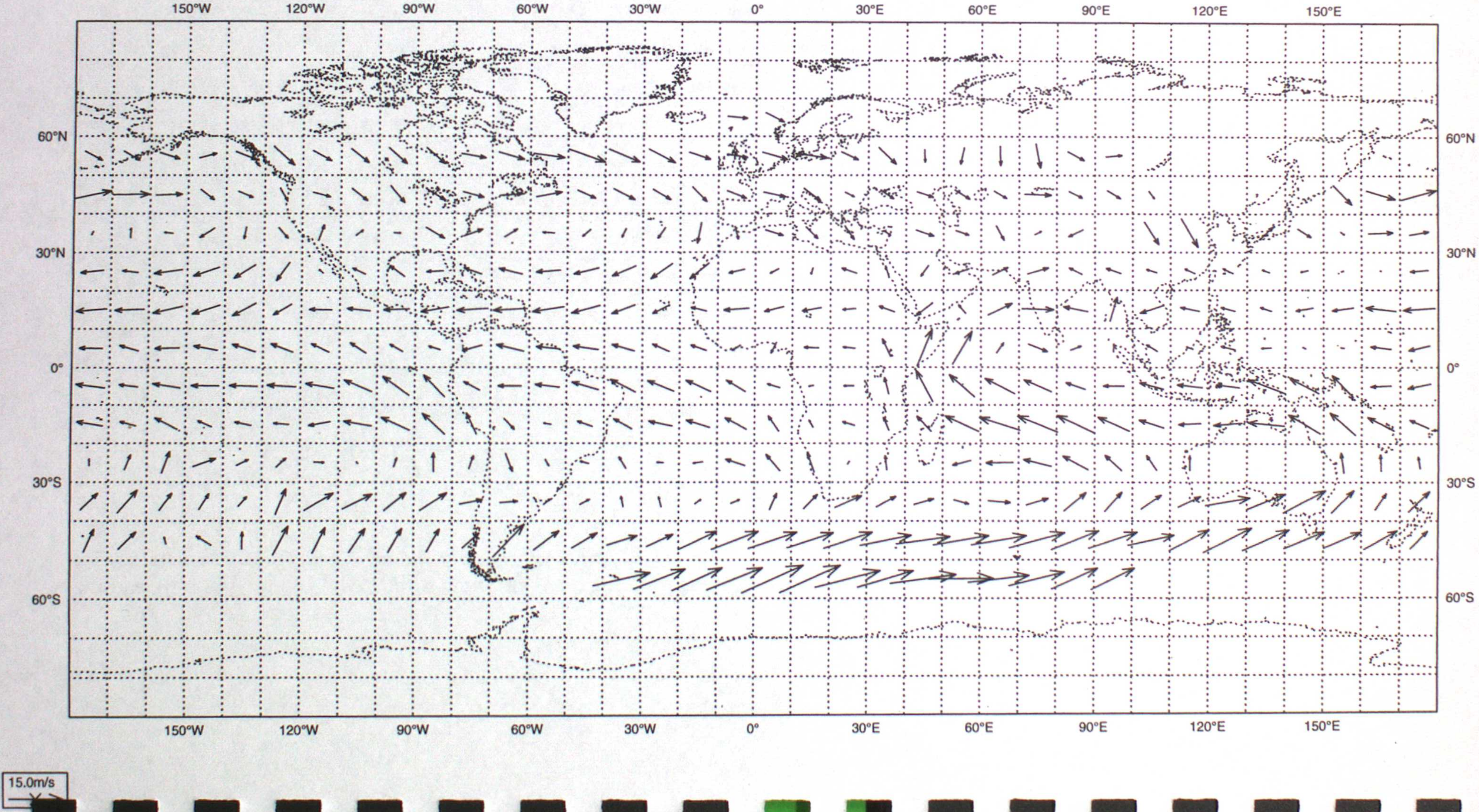

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. JULY 2004
All observations
Arrows are plotted where greater than 10 obs are present

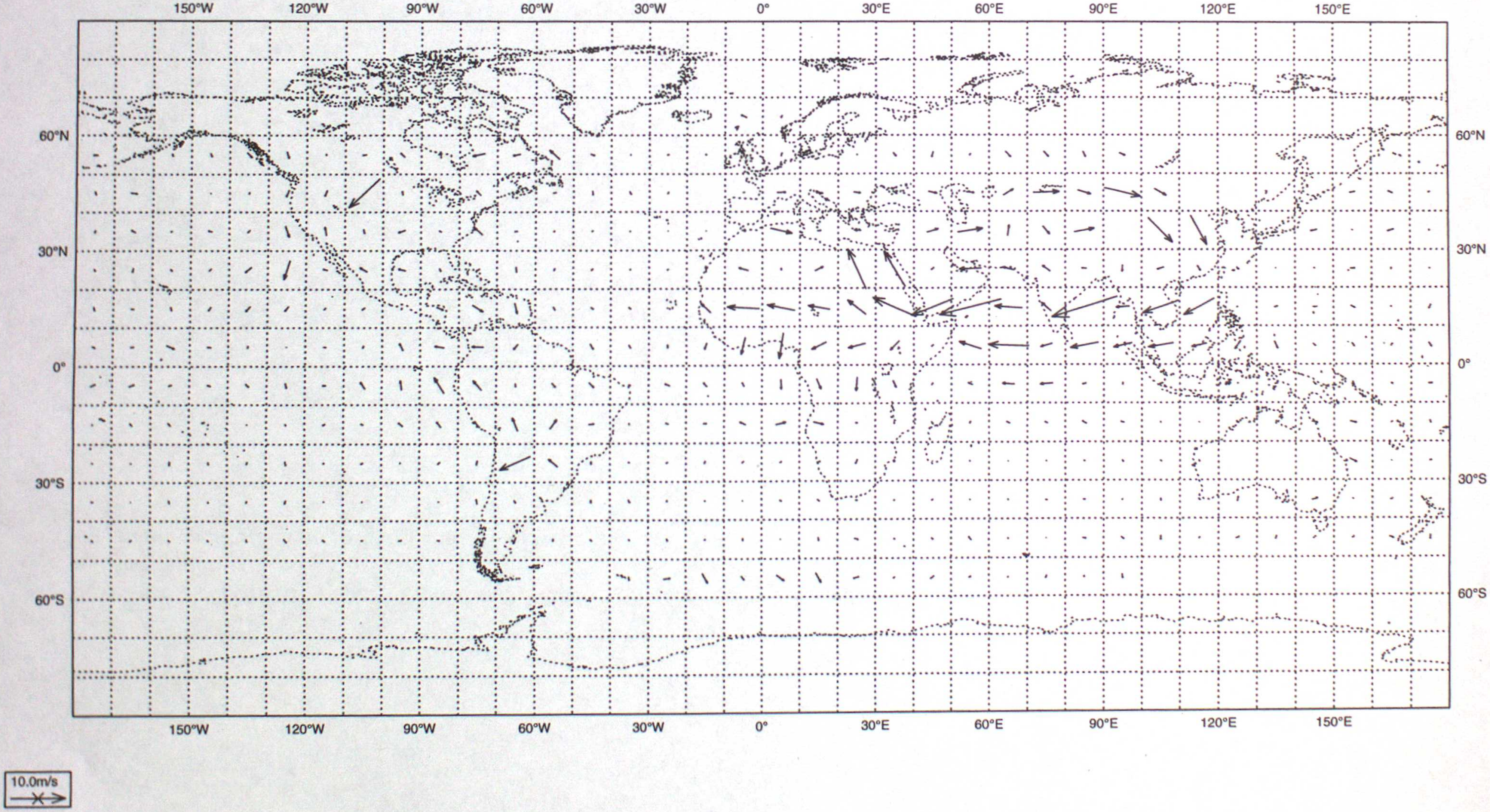

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). JULY 2004
All observations
Values are plotted where greater than 10 obs are present

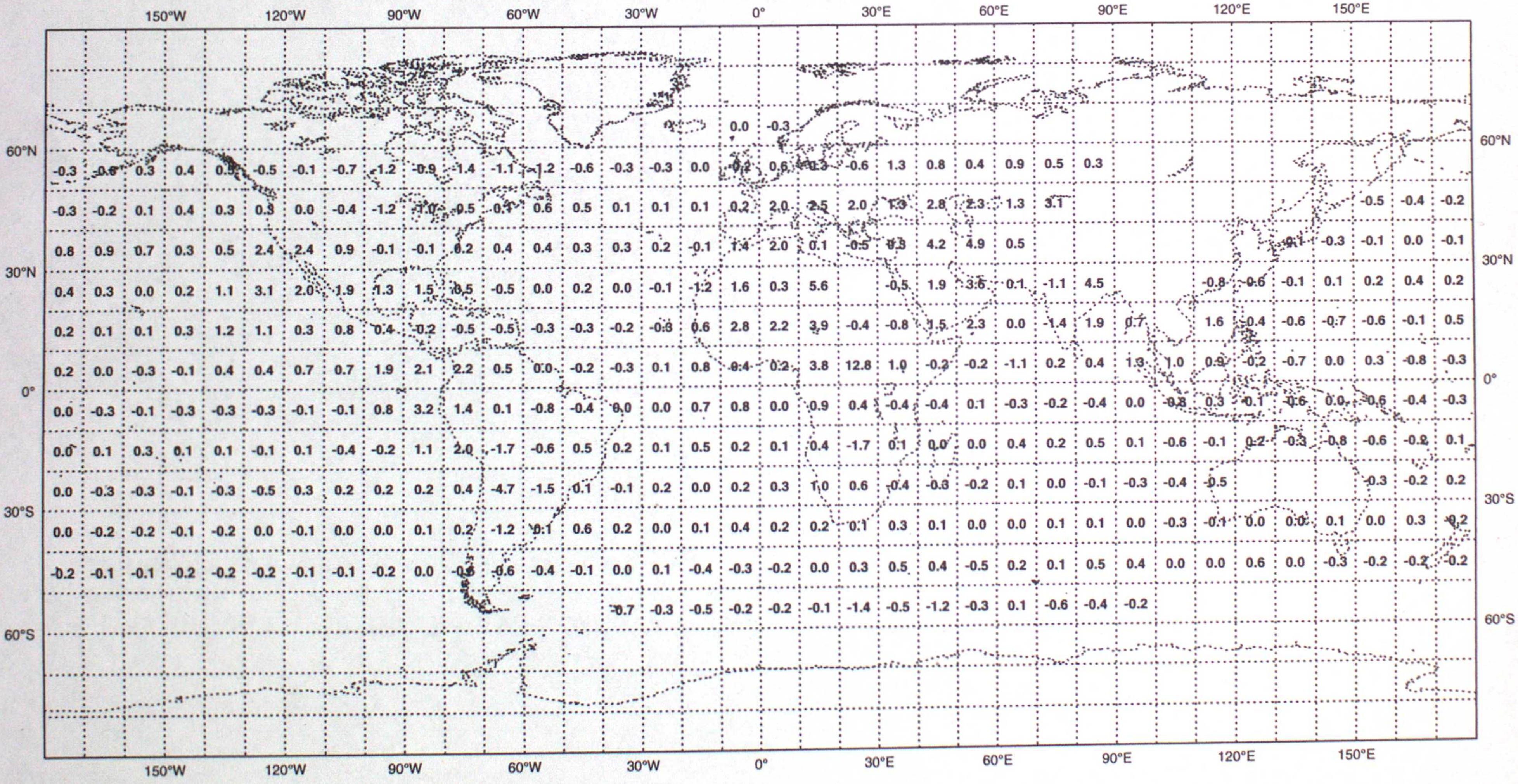
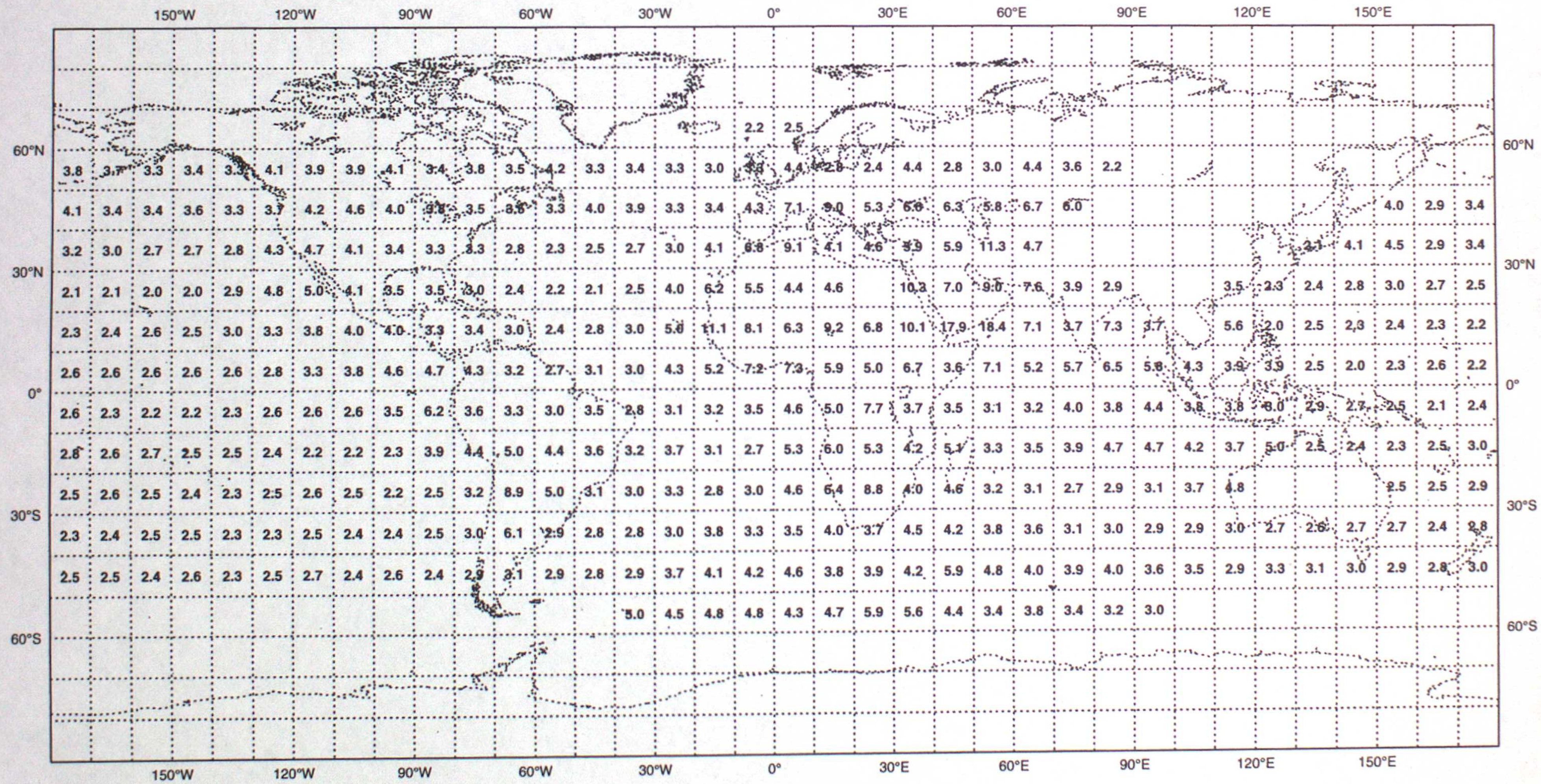

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.0 -0.3
-0.3 -0.6 0.3 0.4 0.5 -0.5 -0.1 -0.7 -1.2 -0.9 -1.4 -1.1 -1.2 -0.6 -0.3 -0.3 0.0 -0.2 0.6 -0.3 -0.6 1.3 0.8 0.4 0.9 0.5 0.3
-0.3 -0.2 0.1 0.4 0.3 0.3 0.0 -0.4 -1.2 -1.0 -0.5 -0.1 0.6 0.5 0.1 0.1 0.1 0.2 2.0 2.5 2.0 1.3 2.8 2.3 1.3 3.1 -0.5 -0.4 -0.2
0.8 0.9 0.7 0.3 0.5 2.4 2.4 0.9 -0.1 -0.1 0.2 0.4 0.4 0.3 0.3 0.2 -0.1 1.4 2.0 0.1 -0.5 0.3 4.2 4.9 0.5 -0.1 -0.3 -0.1 0.0 -0.1
0.4 0.3 0.0 0.2 1.1 3.1 2.0 1.9 1.3 1.5 0.5 -0.5 0.0 0.2 0.0 -0.1 -1.2 1.6 0.3 5.6 -0.5 1.9 3.6 0.1 -1.1 4.5 -0.8 -0.6 -0.1 0.1 0.2 0.4 0.2
0.2 0.1 0.1 0.3 1.2 1.1 0.3 0.8 0.4 -0.2 -0.5 -0.5 -0.3 -0.3 -0.2 -0.3 0.6 2.8 2.2 3.9 -0.4 -0.8 1.5 2.3 0.0 -1.4 1.9 0.7 1.6 -0.4 -0.6 -0.7 -0.6 -0.1 0.5
0.2 0.0 -0.3 -0.1 0.4 0.4 0.7 0.7 1.9 2.1 2.2 0.5 0.0 -0.2 -0.3 0.1 0.8 0.4 0.2 3.8 12.8 1.0 -0.2 -0.2 -1.1 0.2 0.4 1.3 1.0 0.9 -0.2 -0.7 0.0 0.3 -0.8 -0.3
0.0 -0.3 -0.1 -0.3 -0.3 -0.3 -0.1 -0.1 0.8 3.2 1.4 0.1 -0.8 -0.4 0.0 0.0 0.7 0.8 0.0 0.9 0.4 -0.4 -0.4 0.1 -0.3 -0.2 -0.4 0.0 -0.8 0.3 -0.1 -0.6 0.0 -0.6 -0.4 -0.3
0.0 0.1 0.3 0.1 0.1 -0.1 0.1 -0.4 -0.2 1.1 2.0 -1.7 -0.6 0.5 0.2 0.1 0.5 0.2 0.1 0.4 -1.7 0.1 0.0 0.0 0.4 0.2 0.5 0.1 -0.6 -0.1 0.2 -0.3 -0.8 -0.6 -0.2 0.1
0.0 -0.3 -0.3 -0.1 -0.3 -0.5 0.3 0.2 0.2 0.2 0.4 -4.7 -1.5 0.1 -0.1 0.2 0.0 0.2 0.3 1.0 0.6 -0.4 -0.3 -0.2 0.1 0.0 -0.1 -0.3 -0.4 -0.5 -0.3 -0.2 0.2
0.0 -0.2 -0.2 -0.1 -0.2 0.0 -0.1 0.0 0.0 0.1 0.2 -1.2 0.1 0.6 0.2 0.0 0.1 0.4 0.2 0.2 0.1 0.3 0.1 0.0 0.0 0.1 0.1 0.0 -0.3 -0.1 0.0 0.0 0.1 0.0 0.3 0.2
-0.2 -0.1 -0.1 -0.2 -0.2 -0.2 -0.1 -0.1 -0.2 0.0 -0.6 -0.6 -0.4 -0.1 0.0 0.1 -0.4 -0.3 -0.2 0.0 0.3 0.5 0.4 -0.5 0.2 0.1 0.5 0.4 0.0 0.0 0.6 0.0 -0.3 -0.2 -0.2 -0.2
-0.7 -0.3 -0.5 -0.2 -0.2 -0.1 -1.4 -0.5 -1.2 -0.3 0.1 -0.6 -0.4 -0.2

Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). JULY 2004
All observations
Values are plotted where greater than 10 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2.2 2.5
3.8 3.7 3.3 3.4 3.3 4.1 3.9 3.9 4.1 3.4 3.8 3.5 4.2 3.3 3.4 3.3 3.0 3.3 4.4 2.8 2.4 4.4 2.8 3.0 4.4 3.6 2.2
4.1 3.4 3.4 3.6 3.3 3.7 4.2 4.6 4.0 3.8 3.5 3.6 3.3 4.0 3.9 3.3 3.4 4.3 7.1 9.0 5.3 6.6 6.3 5.8 6.7 6.0 4.0 2.9 3.4
3.2 3.0 2.7 2.7 2.8 4.3 4.7 4.1 3.4 3.3 3.3 2.8 2.3 2.5 2.7 3.0 4.1 6.8 9.1 4.1 4.6 3.9 5.9 11.3 4.7 3.1 4.1 4.5 2.9 3.4
2.1 2.1 2.0 2.0 2.9 4.8 5.0 4.1 3.5 3.5 3.0 2.4 2.2 2.1 2.5 4.0 6.2 5.5 4.4 4.6 10.3 7.0 9.0 7.6 3.9 2.9 3.5 2.3 2.4 2.8 3.0 2.7 2.5
2.3 2.4 2.6 2.5 3.0 3.3 3.8 4.0 4.0 3.3 3.4 3.0 2.4 2.8 3.0 5.6 11.1 8.1 6.3 9.2 6.8 10.1 17.9 18.4 7.1 3.7 7.3 3.7 5.6 2.0 2.5 2.3 2.4 2.3 2.2
2.6 2.6 2.6 2.6 2.6 2.8 3.3 3.8 4.6 4.7 4.3 3.2 2.7 3.1 3.0 4.3 5.2 7.2 7.3 5.9 5.0 6.7 3.6 7.1 5.2 5.7 6.5 5.8 4.3 3.9 3.9 2.5 2.0 2.3 2.6 2.2
2.6 2.3 2.2 2.2 2.3 2.6 2.6 2.6 3.5 6.2 3.6 3.3 3.0 3.5 2.8 3.1 3.2 3.5 4.6 5.0 7.7 3.7 3.5 3.1 3.2 4.0 3.8 4.4 3.8 3.8 8.0 2.9 2.7 2.5 2.1 2.4
2.8 2.6 2.7 2.5 2.5 2.4 2.2 2.2 2.3 3.9 4.4 5.0 4.4 3.6 3.2 3.7 3.1 2.7 5.3 6.0 5.3 4.2 5.1 3.3 3.5 3.9 4.7 4.7 4.2 3.7 5.0 2.5 2.4 2.3 2.5 3.0
2.5 2.6 2.5 2.4 2.3 2.5 2.6 2.5 2.2 2.5 3.2 8.9 5.0 3.1 3.0 3.3 2.8 3.0 4.6 6.4 8.8 4.0 4.6 3.2 3.1 2.7 2.9 3.1 3.7 4.8 2.5 2.5 2.9
2.3 2.4 2.5 2.5 2.3 2.3 2.5 2.4 2.4 2.5 3.0 6.1 2.9 2.8 2.8 3.0 3.8 3.3 3.5 4.0 3.7 4.5 4.2 3.8 3.6 3.1 3.0 2.9 2.9 3.0 2.7 2.6 2.7 2.7 2.4 2.8
2.5 2.5 2.4 2.6 2.3 2.5 2.7 2.4 2.6 2.4 2.9 3.1 2.9 2.8 2.9 3.7 4.1 4.2 4.6 3.8 3.9 4.2 5.9 4.8 4.0 3.9 4.0 3.6 3.5 2.9 3.3 3.1 3.0 2.9 2.8 3.0
5.0 4.5 4.8 4.8 4.3 4.7 5.9 5.6 4.4 3.4 3.8 3.4 3.2 3.0

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: EXETER

MONTH: Jul 04

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-9, GOES-10, GOES-12, METEOSAT-5, METEOSAT-7

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 15. SATOB 401 - 700 hPa mean daily count. JULY 2004
Global average number of observations in 24 hours = 15824

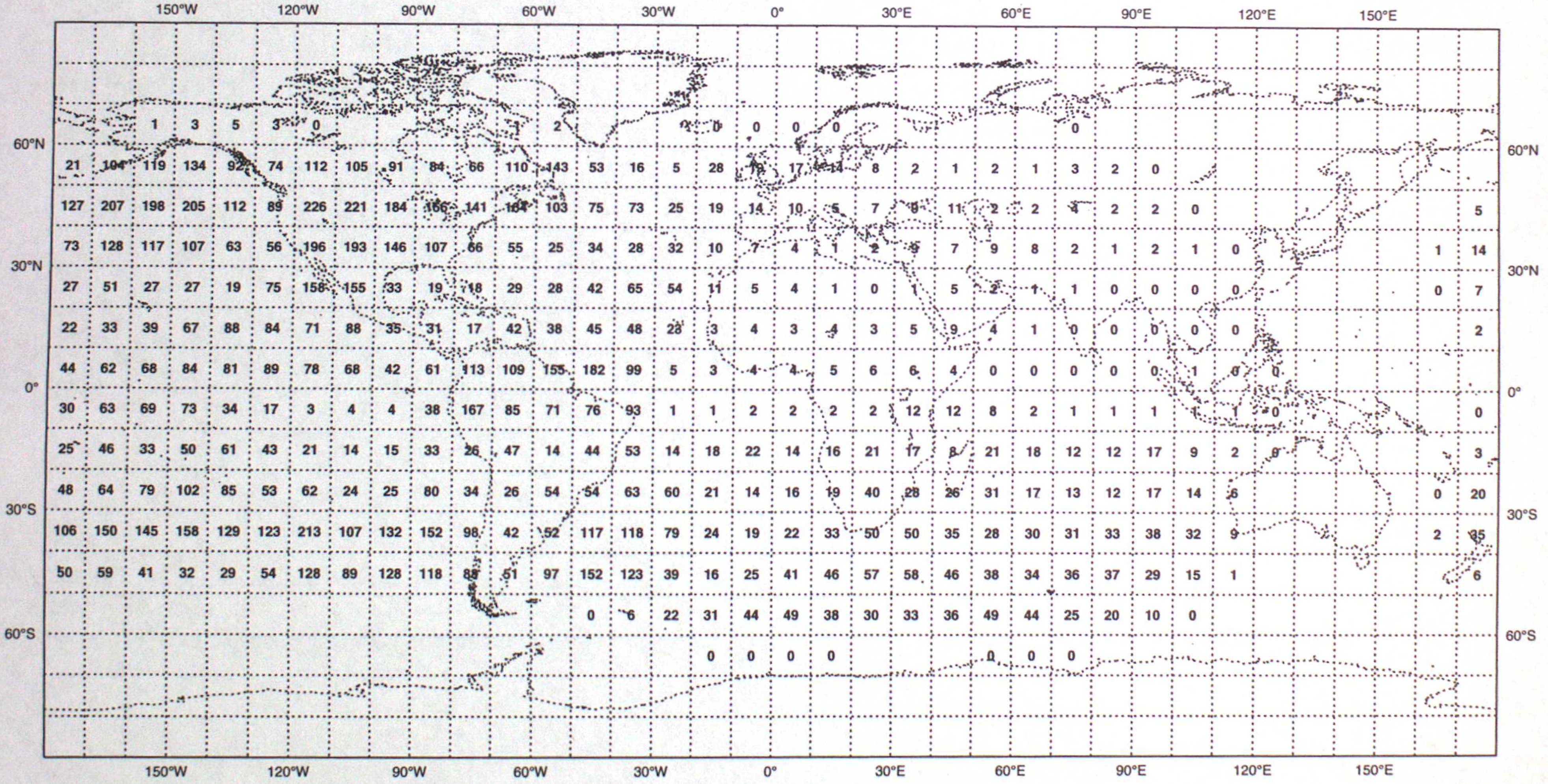

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 3 5 3 0 2 0 0 0 0 0
21 104 119 134 92 74 112 105 91 84 66 110 143 53 16 5 28 19 17 14 8 2 1 2 1 3 2 0
127 207 198 205 112 89 226 221 184 166 141 164 103 75 73 25 19 14 10 5 7 8 11 2 2 4 2 2 0 5
73 128 117 107 63 56 196 193 146 107 66 55 25 34 28 32 10 7 4 1 2 9 7 9 8 2 1 2 1 0 1 14
27 51 27 27 19 75 158 155 33 19 18 29 28 42 65 54 11 5 4 1 0 1 5 2 1 1 0 0 0 0 0 7
22 33 39 67 88 84 71 88 35 31 17 42 38 45 48 28 3 4 3 4 3 5 9 4 1 0 0 0 0 0 2
44 62 68 84 81 89 78 68 42 61 113 109 155 182 99 5 3 4 4 5 6 6 4 0 0 0 0 0 1 0 0
30 63 69 73 34 17 3 4 4 38 167 85 71 76 93 1 1 2 2 2 2 12 12 8 2 1 1 1 1 1 0 0
25 46 33 50 61 43 21 14 15 33 26 47 14 44 53 14 18 22 14 16 21 17 8 21 18 12 12 17 9 2 8 3
48 64 79 102 85 53 62 24 25 80 34 26 54 54 63 60 21 14 16 19 40 28 26 31 17 13 12 17 14 6 0 20
106 150 145 158 129 123 213 107 132 152 98 42 52 117 118 79 24 19 22 33 50 50 35 28 30 31 33 38 32 9 2 35
50 59 41 32 29 54 128 89 128 118 88 51 97 152 123 39 16 25 41 46 57 58 46 38 34 36 37 29 15 1 6
0 6 22 31 44 49 38 30 33 36 49 44 25 20 10 0
0 0 0 0 0 0 0

Figure 16. SATOB 401 - 700 hPa vector mean wind. JULY 2004
All observations
Arrows are plotted where greater than 10 obs are present

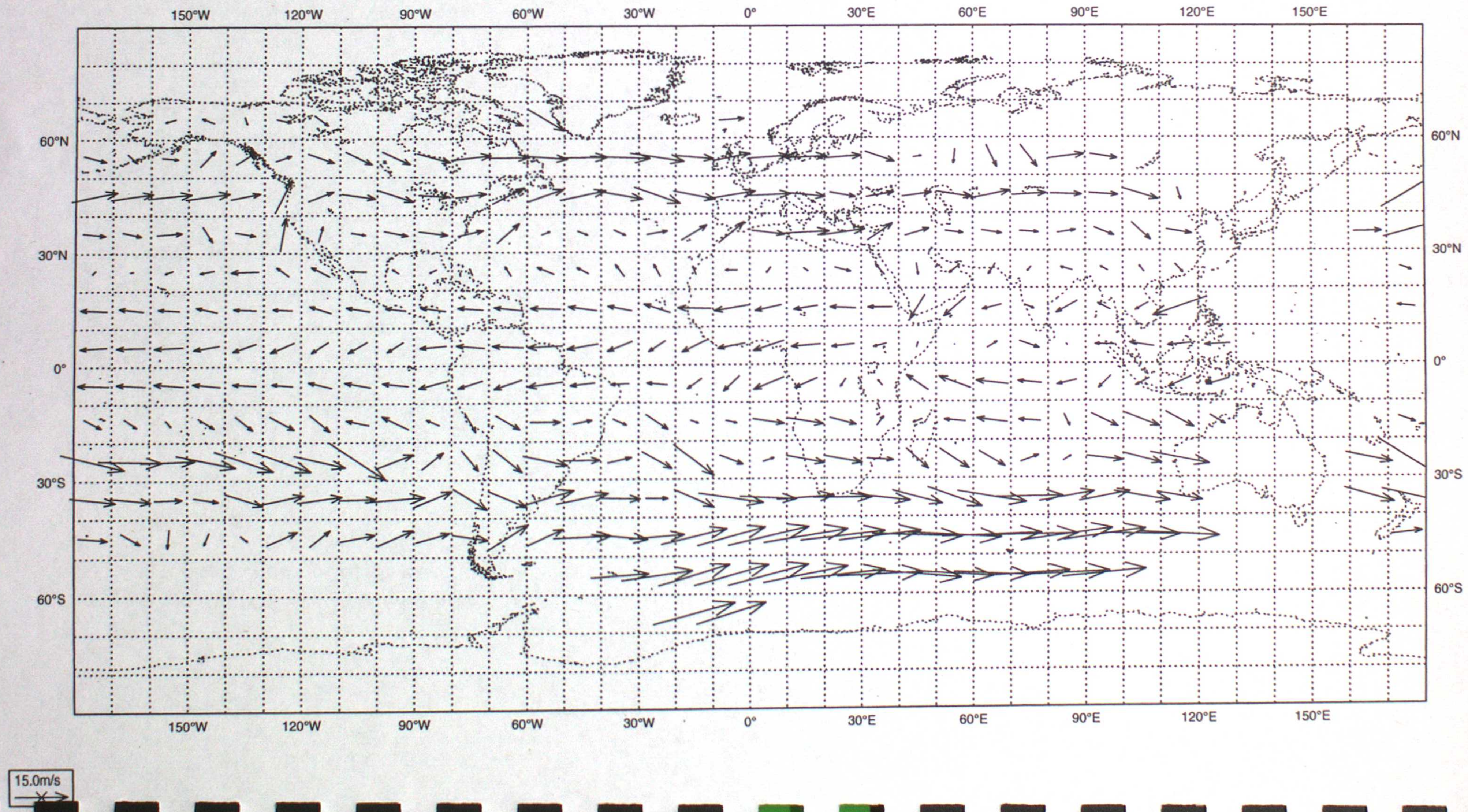

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. JULY 2004
All observations
Arrows are plotted where greater than 10 obs are present

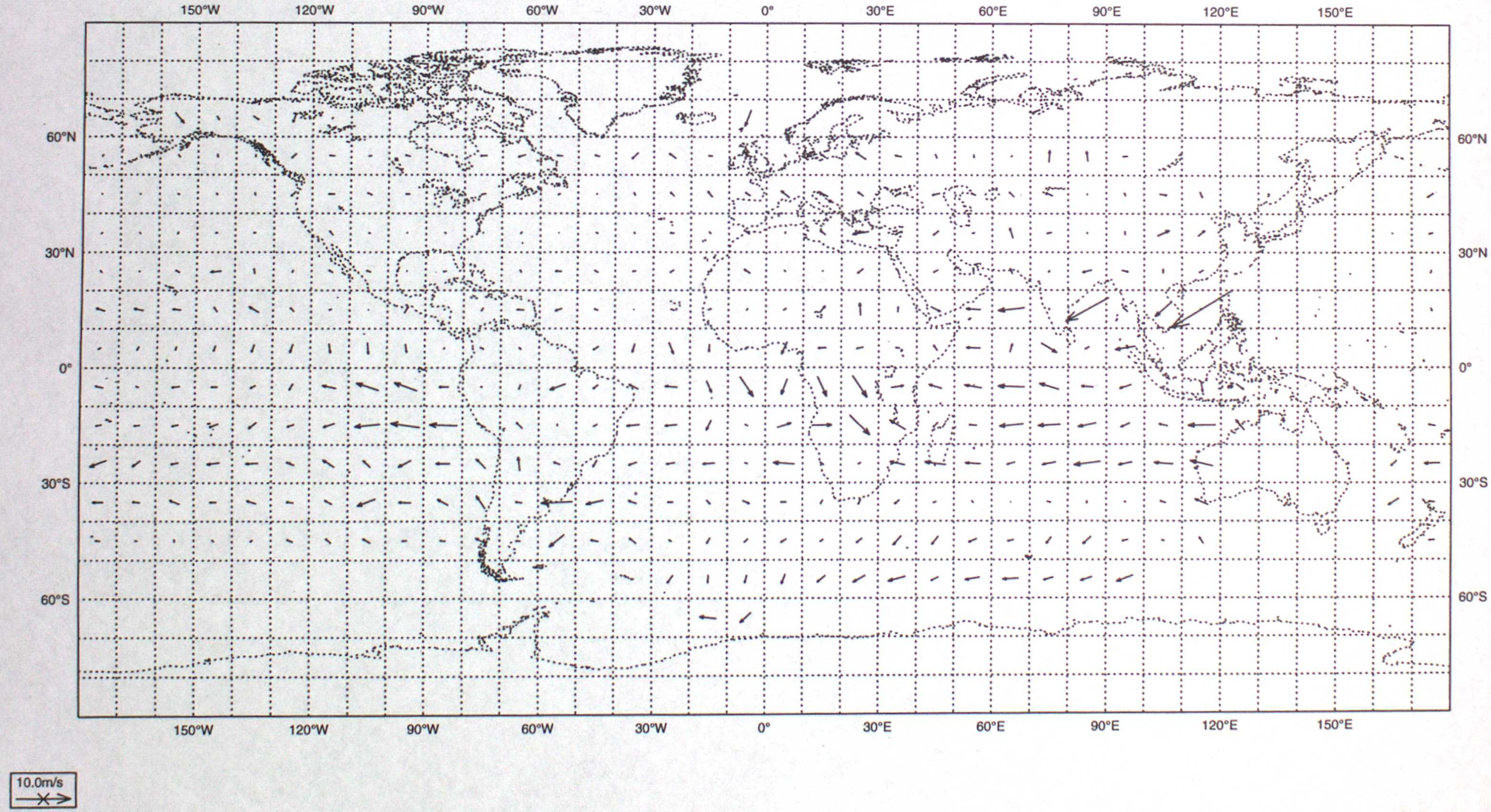

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). JULY 2004
All observations
Values are plotted where greater than 10 obs are present

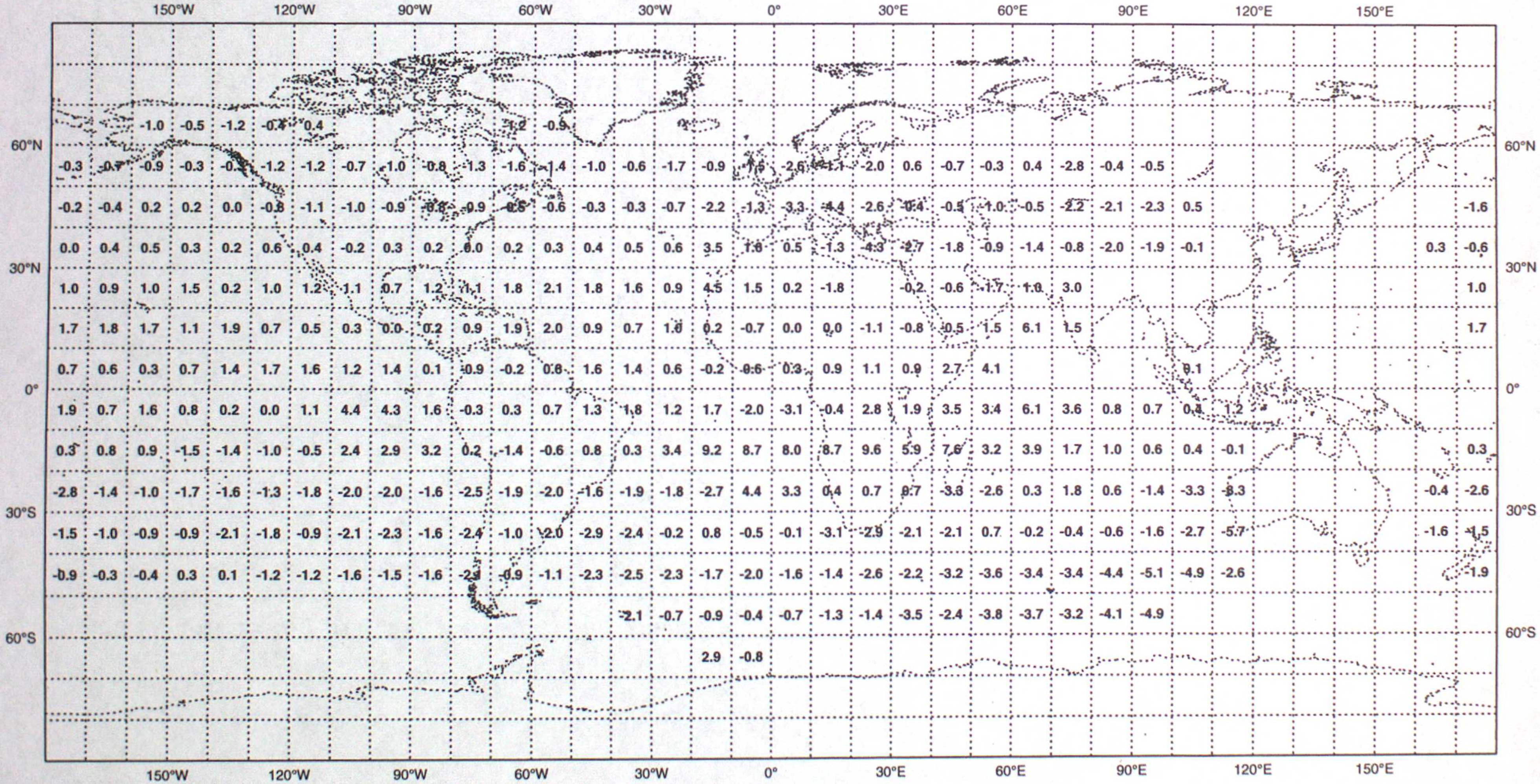

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-1.0 -0.5 -1.2 -0.4 0.4 -1.2 -0.9
-0.3 -0.7 -0.9 -0.3 -0.3 -1.2 -1.2 -0.7 -1.0 -0.8 -1.3 -1.6 -1.4 -1.0 -0.6 -1.7 -0.9 1.5 -2.6 -1.1 -2.0 0.6 -0.7 -0.3 0.4 -2.8 -0.4 -0.5
-0.2 -0.4 0.2 0.2 0.0 -0.8 -1.1 -1.0 -0.9 -0.8 -0.9 -0.5 -0.6 -0.3 -0.3 -0.7 -2.2 -1.3 -3.3 -4.4 -2.6 -0.4 -0.5 -1.0 -0.5 -2.2 -2.1 -2.3 0.5 -1.6
0.0 0.4 0.5 0.3 0.2 0.6 0.4 -0.2 0.3 0.2 0.0 0.2 0.3 0.4 0.5 0.6 3.5 1.8 0.5 -1.3 -4.3 -2.7 -1.8 -0.9 -1.4 -0.8 -2.0 -1.9 -0.1 0.3 -0.6
1.0 0.9 1.0 1.5 0.2 1.0 1.2 1.1 0.7 1.2 1.1 1.8 2.1 1.8 1.6 0.9 4.5 1.5 0.2 -1.8 -0.2 -0.6 -1.7 1.0 3.0 1.0
1.7 1.8 1.7 1.1 1.9 0.7 0.5 0.3 0.0 0.2 0.9 1.9 2.0 0.9 0.7 1.0 0.2 -0.7 0.0 0.0 -1.1 -0.8 -0.5 1.5 6.1 1.5 1.7
0.7 0.6 0.3 0.7 1.4 1.7 1.6 1.2 1.4 0.1 -0.9 -0.2 0.6 1.6 1.4 0.6 -0.2 -0.6 0.3 0.9 1.1 0.9 2.7 4.1 0.1
1.9 0.7 1.6 0.8 0.2 0.0 1.1 4.4 4.3 1.6 -0.3 0.3 0.7 1.3 1.8 1.2 1.7 -2.0 -3.1 -0.4 2.8 1.9 3.5 3.4 6.1 3.6 0.8 0.7 0.4 1.2
0.3 0.8 0.9 -1.5 -1.4 -1.0 -0.5 2.4 2.9 3.2 0.2 -1.4 -0.6 0.8 0.3 3.4 9.2 8.7 8.0 8.7 9.6 5.9 7.6 3.2 3.9 1.7 1.0 0.6 0.4 -0.1 0.3
-2.8 -1.4 -1.0 -1.7 -1.6 -1.3 -1.8 -2.0 -2.0 -1.6 -2.5 -1.9 -2.0 -1.6 -1.9 -1.8 -2.7 4.4 3.3 0.4 0.7 8.7 -3.8 -2.6 0.3 1.8 0.6 -1.4 -3.3 -8.3 -0.4 -2.6
-1.5 -1.0 -0.9 -0.9 -2.1 -1.8 -0.9 -2.1 -2.3 -1.6 -2.4 -1.0 2.0 -2.9 -2.4 -0.2 0.8 -0.5 -0.1 -3.1 -2.9 -2.1 -2.1 0.7 -0.2 -0.4 -0.6 -1.6 -2.7 -5.7 -1.6 1.5
-0.9 -0.3 -0.4 0.3 0.1 -1.2 -1.2 -1.6 -1.5 -1.6 -2.3 -0.9 -1.1 -2.3 -2.5 -2.3 -1.7 -2.0 -1.6 -1.4 -2.6 -2.2 -3.2 -3.6 -3.4 -3.4 -4.4 -5.1 -4.9 -2.6 -1.9
-2.1 -0.7 -0.9 -0.4 -0.7 -1.3 -1.4 -3.5 -2.4 -3.8 -3.7 -3.2 -4.1 -4.9
2.9 -0.8

Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms-1). JULY 2004
All observations
Values are plotted where greater than 10 obs are present

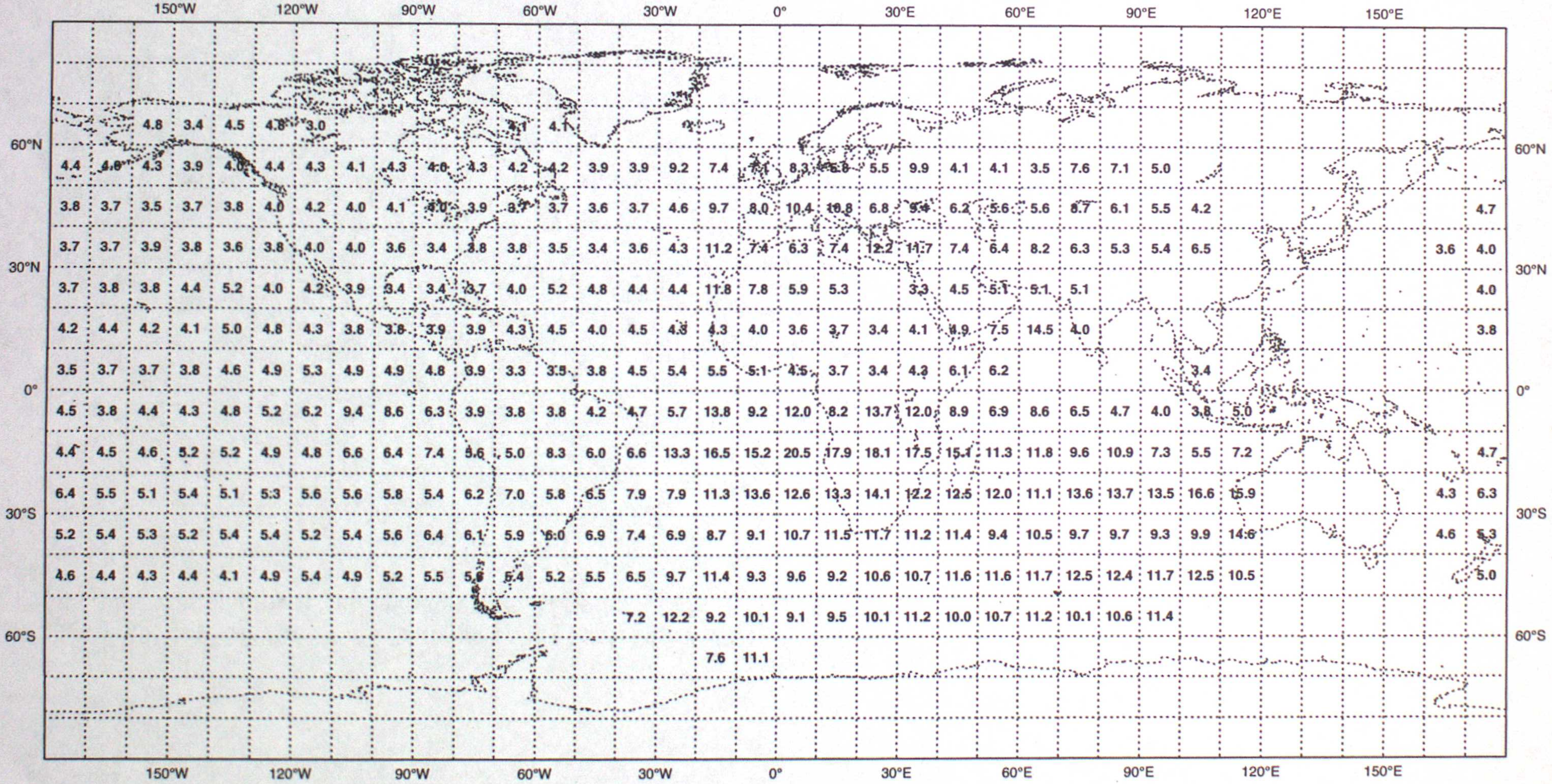

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.8 3.4 4.5 4.8 3.0 4.1 4.1
4.4 4.8 4.3 3.9 4.0 4.4 4.3 4.1 4.3 4.0 4.3 4.2 4.2 3.9 3.9 9.2 7.4 7.1 8.3 6.8 5.5 9.9 4.1 4.1 3.5 7.6 7.1 5.0
3.8 3.7 3.5 3.7 3.8 4.0 4.2 4.0 4.1 4.0 3.9 3.7 3.7 3.6 3.7 4.6 9.7 8.0 10.4 10.8 6.8 9.4 6.2 5.6 5.6 8.7 6.1 5.5 4.2 4.7
3.7 3.7 3.9 3.8 3.6 3.8 4.0 4.0 3.6 3.4 3.8 3.8 3.5 3.4 3.6 4.3 11.2 7.4 6.3 7.4 12.2 11.7 7.4 6.4 8.2 6.3 5.3 5.4 6.5 3.6 4.0
3.7 3.8 3.8 4.4 5.2 4.0 4.2 3.9 3.4 3.4 3.7 4.0 5.2 4.8 4.4 4.4 11.8 7.8 5.9 5.3 3.3 4.5 5.1 5.1 5.1 4.0
4.2 4.4 4.2 4.1 5.0 4.8 4.3 3.8 3.8 3.9 3.9 4.3 4.5 4.0 4.5 4.3 4.3 4.0 3.6 3.7 3.4 4.1 4.9 7.5 14.5 4.0 3.8
3.5 3.7 3.7 3.8 4.6 4.9 5.3 4.9 4.9 4.8 3.9 3.3 3.5 3.8 4.5 5.4 5.5 5.1 4.5 3.7 3.4 4.3 6.1 6.2 3.4
4.5 3.8 4.4 4.3 4.8 5.2 6.2 9.4 8.6 6.3 3.9 3.8 3.8 4.2 4.7 5.7 13.8 9.2 12.0 8.2 13.7 12.0 8.9 6.9 8.6 6.5 4.7 4.0 3.8 5.0
4.4 4.5 4.6 5.2 5.2 4.9 4.8 6.6 6.4 7.4 5.6 5.0 8.3 6.0 6.6 13.3 16.5 15.2 20.5 17.9 18.1 17.5 15.1 11.3 11.8 9.6 10.9 7.3 5.5 7.2 4.7
6.4 5.5 5.1 5.4 5.1 5.3 5.6 5.6 5.8 5.4 6.2 7.0 5.8 6.5 7.9 7.9 11.3 13.6 12.6 13.3 14.1 12.2 12.5 12.0 11.1 13.6 13.7 13.5 16.6 15.9 4.3 6.3
5.2 5.4 5.3 5.2 5.4 5.4 5.2 5.4 5.6 6.4 6.1 5.9 6.0 6.9 7.4 6.9 8.7 9.1 10.7 11.5 11.7 11.2 11.4 9.4 10.5 9.7 9.7 9.3 9.9 14.6 4.6 5.3
4.6 4.4 4.3 4.4 4.1 4.9 5.4 4.9 5.2 5.5 5.6 5.4 5.2 5.5 6.5 9.7 11.4 9.3 9.6 9.2 10.6 10.7 11.6 11.6 11.7 12.5 12.4 11.7 12.5 10.5 5.0
7.2 12.2 9.2 10.1 9.1 9.5 10.1 11.2 10.0 10.7 11.2 10.1 10.6 11.4
7.6 11.1

Figure 20. SATOB 101 - 400 hPa mean daily count. JULY 2004
Global average number of observations in 24 hours = 177442

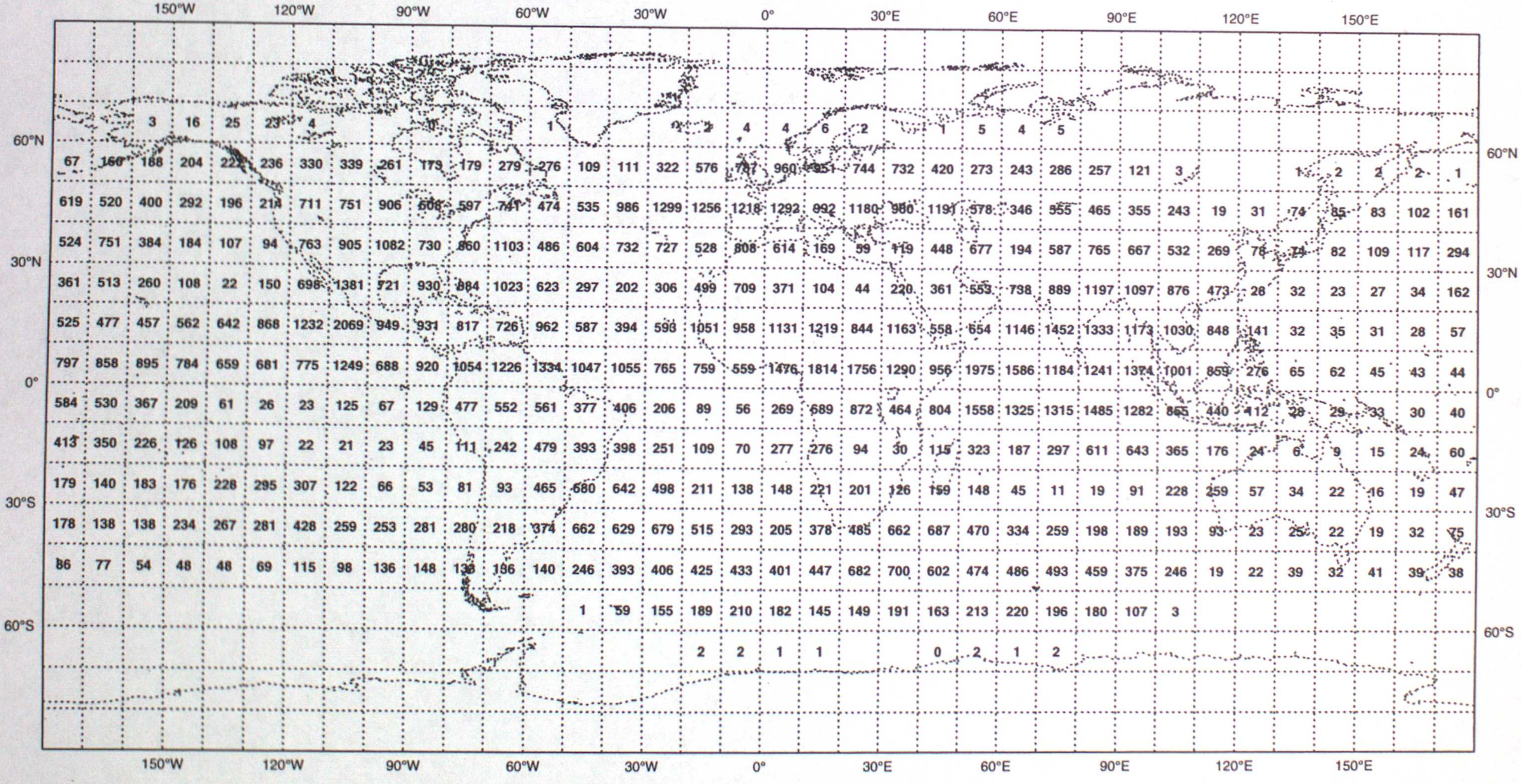

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3 16 25 23 4 1 1 2 4 4 6 2 1 5 4 5
67 160 188 204 222 236 330 339 261 173 179 279 276 109 111 322 576 787 960 951 744 732 420 273 243 286 257 121 3 1 2 2 2 1
619 520 400 292 196 218 711 751 906 608 597 741 474 535 986 1299 1256 1218 1292 892 1180 980 1191 578 346 555 465 355 243 19 31 74 85 83 102 161
524 751 384 184 107 94 763 905 1082 730 860 1103 486 604 732 727 528 808 614 169 59 119 448 677 194 587 765 667 532 269 78 74 82 109 117 294
361 513 260 108 22 150 698 1381 721 930 884 1023 623 297 202 306 499 709 371 104 44 220 361 553 738 889 1197 1097 876 473 28 32 23 27 34 162
525 477 457 562 642 868 1232 2069 949 931 817 726 962 587 394 593 1051 958 1131 1219 844 1163 558 654 1146 1452 1333 1173 1030 848 141 32 35 31 28 57
797 858 895 784 659 681 775 1249 688 920 1054 1226 1334 1047 1055 765 759 559 1476 1814 1756 1290 956 1975 1586 1184 1241 1374 1001 859 276 65 62 45 43 44
584 530 367 209 61 26 23 125 67 129 477 552 561 377 406 206 89 56 269 689 872 464 804 1558 1325 1315 1485 1282 865 440 412 28 29 33 30 40
413 350 226 126 108 97 22 21 23 45 111 242 479 393 398 251 109 70 277 276 94 30 115 323 187 297 611 643 365 176 24 6 9 15 24 60
179 140 183 176 228 295 307 122 66 53 81 93 465 680 642 498 211 138 148 221 201 126 159 148 45 11 19 91 228 259 57 34 22 16 19 47
178 138 138 234 267 281 428 259 253 281 280 218 374 662 629 679 515 293 205 378 485 662 687 470 334 259 198 189 193 93 23 25 22 19 32 75
86 77 54 48 48 69 115 98 136 148 138 186 140 246 393 406 425 433 401 447 682 700 602 474 486 493 459 375 246 19 22 39 32 41 39 38
1 59 155 189 210 182 145 149 191 163 213 220 196 180 107 3
2 2 1 1 0 2 1 2
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 21. SATOB 101 - 400 hPa vector mean wind. JULY 2004
All observations
Arrows are plotted where greater than 10 obs are present

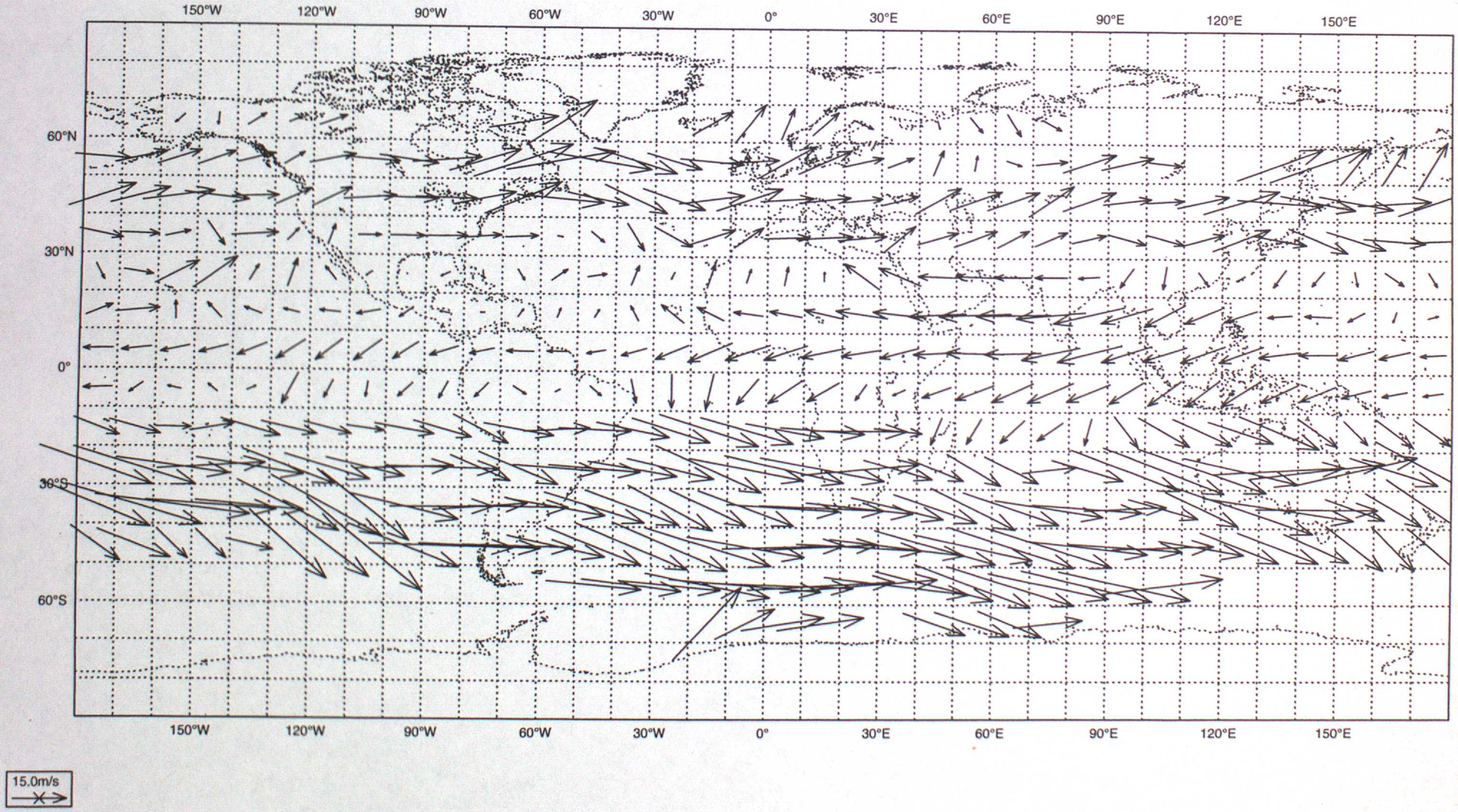

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa mean vector wind differences. JULY 2004
All observations
Arrows are plotted where greater than 10 obs are present

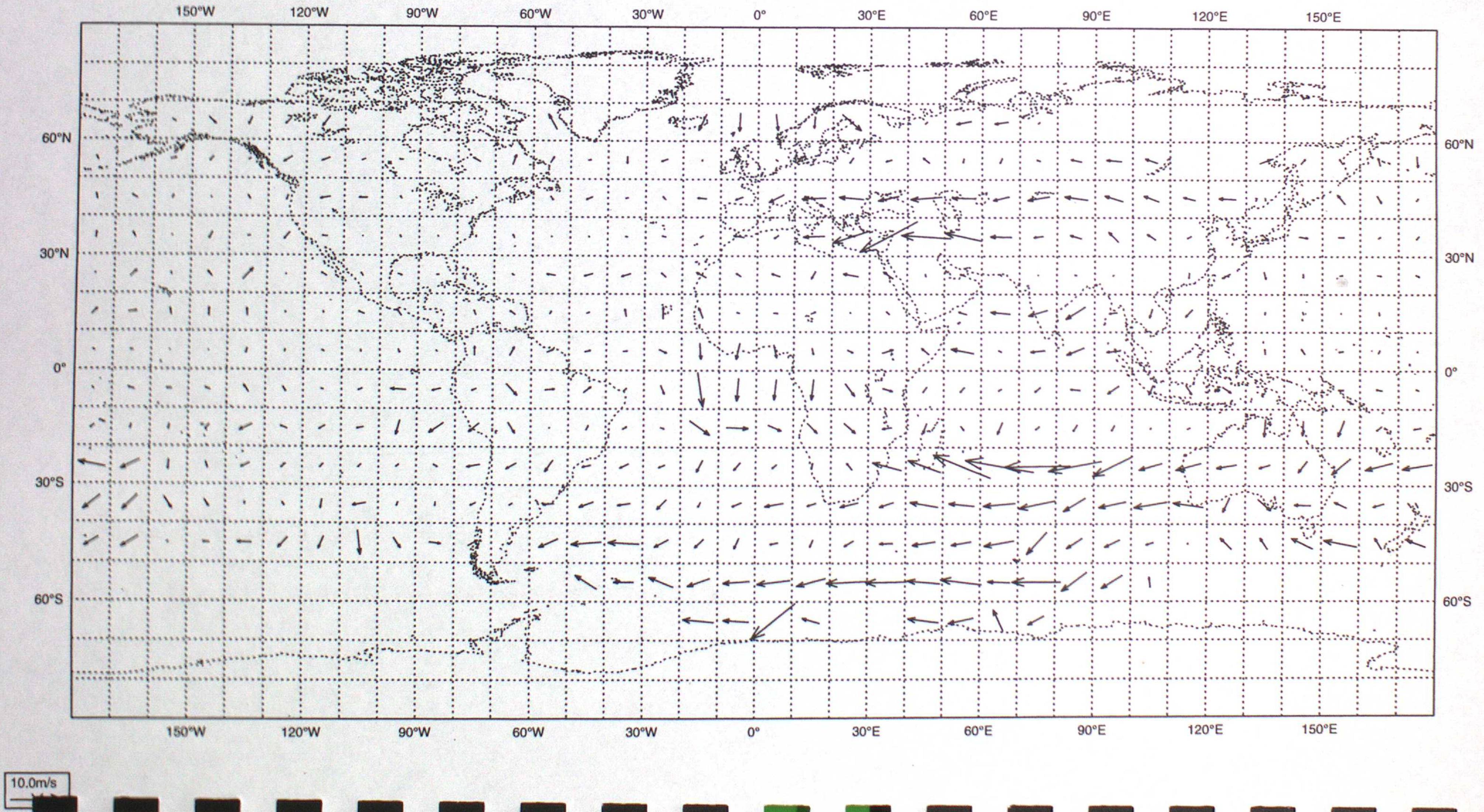

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). JULY 2004
All observations
Values are plotted where greater than 10 obs are present

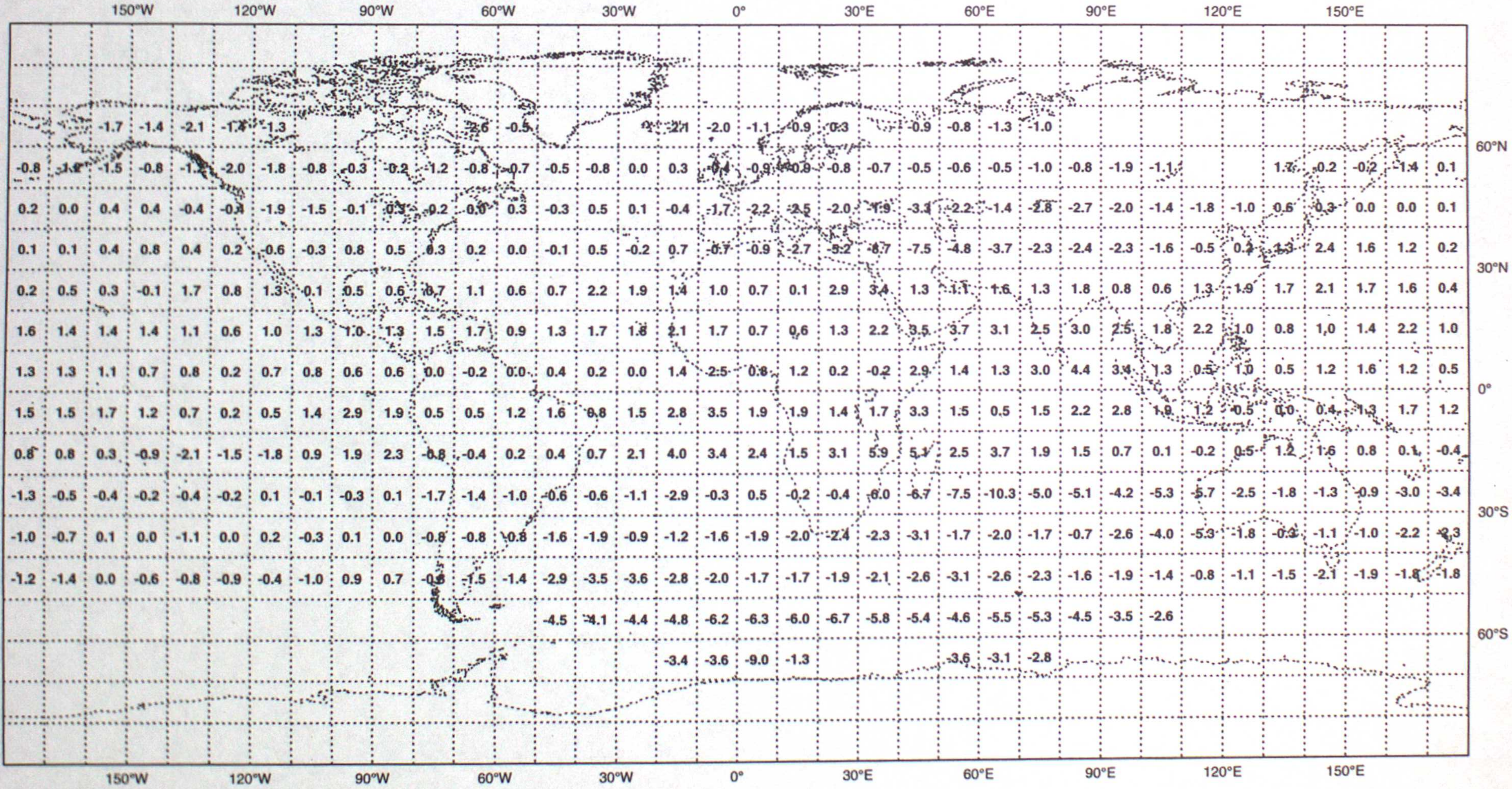
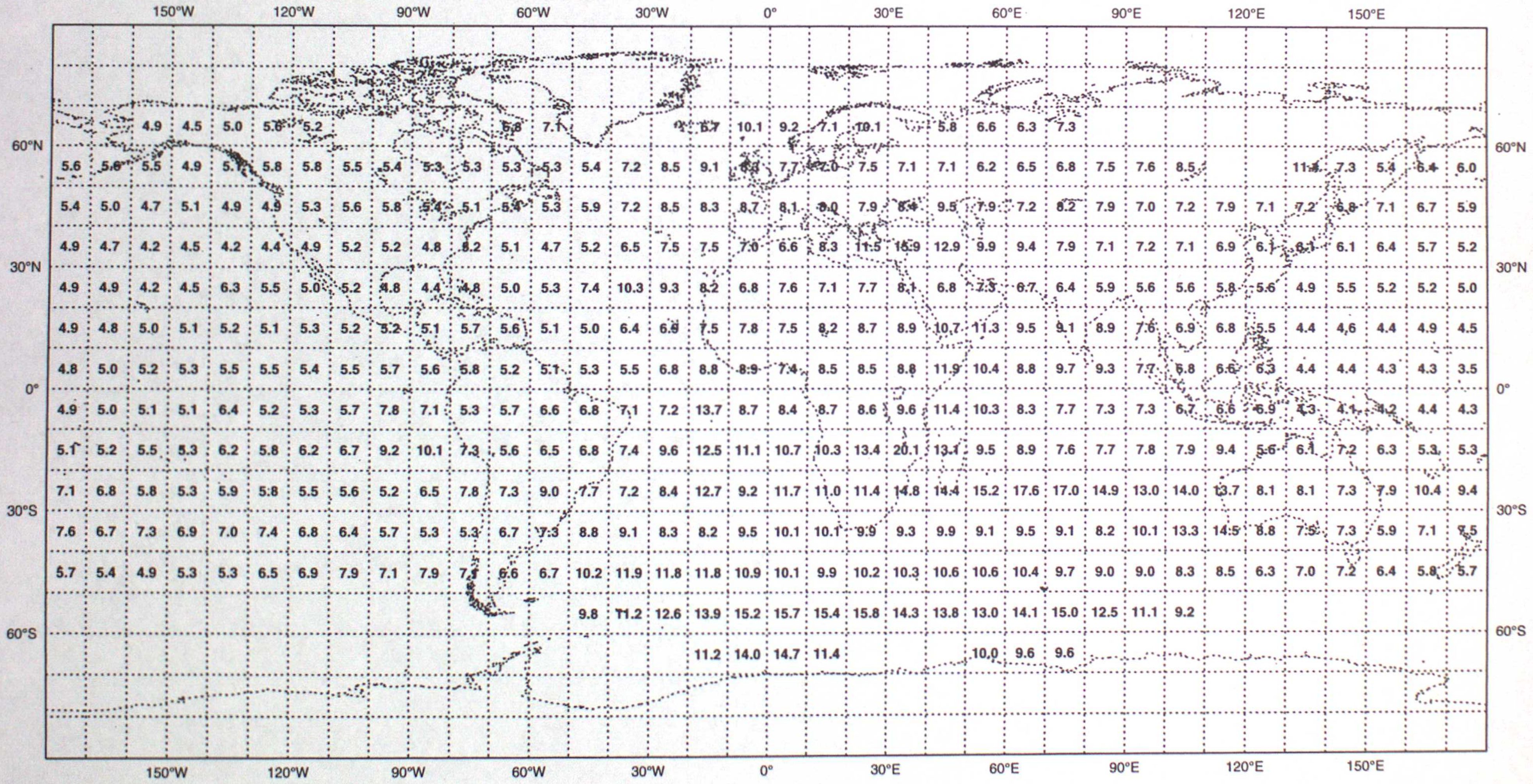

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-1.7 -1.4 -2.1 -1.4 -1.3 -2.6 -0.5 -2.1 -2.0 -1.1 -0.9 0.3 -0.9 -0.8 -1.3 -1.0
-0.8 -1.2 -1.5 -0.8 -1.2 -2.0 -1.8 -0.8 -0.3 -0.2 -1.2 -0.8 -0.7 -0.5 -0.8 0.0 0.3 -0.4 -0.9 -0.9 -0.8 -0.7 -0.5 -0.6 -0.5 -1.0 -0.8 -1.9 -1.1 1.7 -0.2 -0.2 -1.4 0.1
0.2 0.0 0.4 0.4 -0.4 -0.3 -1.9 -1.5 -0.1 0.3 -0.2 0.0 0.3 -0.3 0.5 0.1 -0.4 -1.7 -2.2 -2.5 -2.0 -1.9 -3.3 -2.2 -1.4 -2.8 -2.7 -2.0 -1.4 -1.8 -1.0 0.6 0.3 0.0 0.0 0.1
0.1 0.1 0.4 0.8 0.4 0.2 -0.6 -0.3 0.8 0.5 0.3 0.2 0.0 -0.1 0.5 -0.2 0.7 -0.7 -0.9 -2.7 -5.2 -8.7 -7.5 -4.8 -3.7 -2.3 -2.4 -2.3 -1.6 -0.5 0.2 1.3 2.4 1.6 1.2 0.2
0.2 0.5 0.3 -0.1 1.7 0.8 1.3 -0.1 0.5 0.6 0.7 1.1 0.6 0.7 2.2 1.9 1.4 1.0 0.7 0.1 2.9 3.4 1.3 1.1 1.6 1.3 1.8 0.8 0.6 1.3 1.9 1.7 2.1 1.7 1.6 0.4
1.6 1.4 1.4 1.4 1.1 0.6 1.0 1.3 1.0 1.3 1.5 1.7 0.9 1.3 1.7 1.8 2.1 1.7 0.7 0.6 1.3 2.2 3.5 3.7 3.1 2.5 3.0 2.5 1.8 2.2 1.0 0.8 1.0 1.4 2.2 1.0
1.3 1.3 1.1 0.7 0.8 0.2 0.7 0.8 0.6 0.6 0.0 -0.2 0.0 0.4 0.2 0.0 1.4 2.5 0.8 1.2 0.2 -0.2 2.9 1.4 1.3 3.0 4.4 3.4 1.3 0.5 1.0 0.5 1.2 1.6 1.2 0.5
1.5 1.5 1.7 1.2 0.7 0.2 0.5 1.4 2.9 1.9 0.5 0.5 1.2 1.6 0.8 1.5 2.8 3.5 1.9 1.9 1.4 1.7 3.3 1.5 0.5 1.5 2.2 2.8 1.9 1.2 -0.5 0.0 0.4 1.3 1.7 1.2
0.8 0.8 0.3 -0.9 -2.1 -1.5 -1.8 0.9 1.9 2.3 -0.8 -0.4 0.2 0.4 0.7 2.1 4.0 3.4 2.4 1.5 3.1 5.9 5.1 2.5 3.7 1.9 1.5 0.7 0.1 -0.2 0.5 1.2 1.6 0.8 0.1 -0.4
-1.3 -0.5 -0.4 -0.2 -0.4 -0.2 0.1 -0.1 -0.3 0.1 -1.7 -1.4 -1.0 -0.6 -0.6 -1.1 -2.9 -0.3 0.5 -0.2 -0.4 -6.0 -6.7 -7.5 -10.3 -5.0 -5.1 -4.2 -5.3 -5.7 -2.5 -1.8 -1.3 -0.9 -3.0 -3.4
-1.0 -0.7 0.1 0.0 -1.1 0.0 0.2 -0.3 0.1 0.0 -0.8 -0.8 -0.8 -1.6 -1.9 -0.9 -1.2 -1.6 -1.9 -2.0 -2.4 -2.3 -3.1 -1.7 -2.0 -1.7 -0.7 -2.6 -4.0 -5.3 -1.8 -0.3 -1.1 -1.0 -2.2 -2.3
-1.2 -1.4 0.0 -0.6 -0.8 -0.9 -0.4 -1.0 0.9 0.7 -0.8 -1.5 -1.4 -2.9 -3.5 -3.6 -2.8 -2.0 -1.7 -1.7 -1.9 -2.1 -2.6 -3.1 -2.6 -2.3 -1.6 -1.9 -1.4 -0.8 -1.1 -1.5 -2.1 -1.9 -1.8 -1.8
-4.5 -4.1 -4.4 -4.8 -6.2 -6.3 -6.0 -6.7 -5.8 -5.4 -4.6 -5.5 -5.3 -4.5 -3.5 -2.6
-3.4 -3.6 -9.0 -1.3 -3.6 -3.1 -2.8

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). JULY 2004
All observations
Values are plotted where greater than 10 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.9 4.5 5.0 5.6 5.2 5.8 7.1 5.7 10.1 9.2 7.1 10.1 5.8 6.6 6.3 7.3
5.6 5.6 5.5 4.9 5.1 5.8 5.8 5.5 5.4 5.3 5.3 5.3 5.3 5.4 7.2 8.5 9.1 6.8 7.7 7.0 7.5 7.1 7.1 6.2 6.5 6.8 7.5 7.6 8.5 11.4 7.3 5.4 6.4 6.0
5.4 5.0 4.7 5.1 4.9 4.9 5.3 5.6 5.8 5.4 5.1 5.4 5.3 5.9 7.2 8.5 8.3 8.7 8.1 8.0 7.9 8.4 9.5 7.9 7.2 8.2 7.9 7.0 7.2 7.9 7.1 7.2 6.8 7.1 6.7 5.9
4.9 4.7 4.2 4.5 4.2 4.4 4.9 5.2 5.2 4.8 8.2 5.1 4.7 5.2 6.5 7.5 7.5 7.0 6.6 8.3 11.5 15.9 12.9 9.9 9.4 7.9 7.1 7.2 7.1 6.9 6.1 6.1 6.1 6.4 5.7 5.2
4.9 4.9 4.2 4.5 6.3 5.5 5.0 5.2 4.8 4.4 4.8 5.0 5.3 7.4 10.3 9.3 8.2 6.8 7.6 7.1 7.7 8.1 6.8 7.3 6.7 6.4 5.9 5.6 5.6 5.8 5.6 4.9 5.5 5.2 5.2 5.0
4.9 4.8 5.0 5.1 5.2 5.1 5.3 5.2 5.2 5.1 5.7 5.6 5.1 5.0 6.4 6.9 7.5 7.8 7.5 8.2 8.7 8.9 10.7 11.3 9.5 9.1 8.9 7.6 6.9 6.8 5.5 4.4 4.6 4.4 4.9 4.5
4.8 5.0 5.2 5.3 5.5 5.5 5.4 5.5 5.7 5.6 5.8 5.2 5.1 5.3 5.5 6.8 8.8 8.9 7.4 8.5 8.5 8.8 11.9 10.4 8.8 9.7 9.3 7.7 6.8 6.6 6.3 4.4 4.4 4.3 4.3 3.5
4.9 5.0 5.1 5.1 6.4 5.2 5.3 5.7 7.8 7.1 5.3 5.7 6.6 6.8 7.1 7.2 13.7 8.7 8.4 8.7 8.6 9.6 11.4 10.3 8.3 7.7 7.3 7.3 6.7 6.6 6.9 4.3 4.1 4.2 4.4 4.3
5.1 5.2 5.5 5.3 6.2 5.8 6.2 6.7 9.2 10.1 7.3 5.6 6.5 6.8 7.4 9.6 12.5 11.1 10.7 10.3 13.4 20.1 13.1 9.5 8.9 7.6 7.7 7.8 7.9 9.4 5.6 6.1 7.2 6.3 5.3 5.3
7.1 6.8 5.8 5.3 5.9 5.8 5.5 5.6 5.2 6.5 7.8 7.3 9.0 7.7 7.2 8.4 12.7 9.2 11.7 11.0 11.4 14.8 14.4 15.2 17.6 17.0 14.9 13.0 14.0 13.7 8.1 8.1 7.3 7.9 10.4 9.4
7.6 6.7 7.3 6.9 7.0 7.4 6.8 6.4 5.7 5.3 5.3 6.7 7.3 8.8 9.1 8.3 8.2 9.5 10.1 10.1 9.9 9.3 9.9 9.1 9.5 9.1 8.2 10.1 13.3 14.5 8.8 7.5 7.3 5.9 7.1 7.5
5.7 5.4 4.9 5.3 5.3 6.5 6.9 7.9 7.1 7.9 7.1 6.6 6.7 10.2 11.9 11.8 11.8 10.9 10.1 9.9 10.2 10.3 10.6 10.6 10.4 9.7 9.0 9.0 8.3 8.5 6.3 7.0 7.2 6.4 5.8 5.7
9.8 11.2 12.6 13.9 15.2 15.7 15.4 15.8 14.3 13.8 13.0 14.1 15.0 12.5 11.1 9.2
11.2 14.0 14.7 11.4 10.0 9.6 9.6

MONITORING OF SATELLITE TEMPERATURES

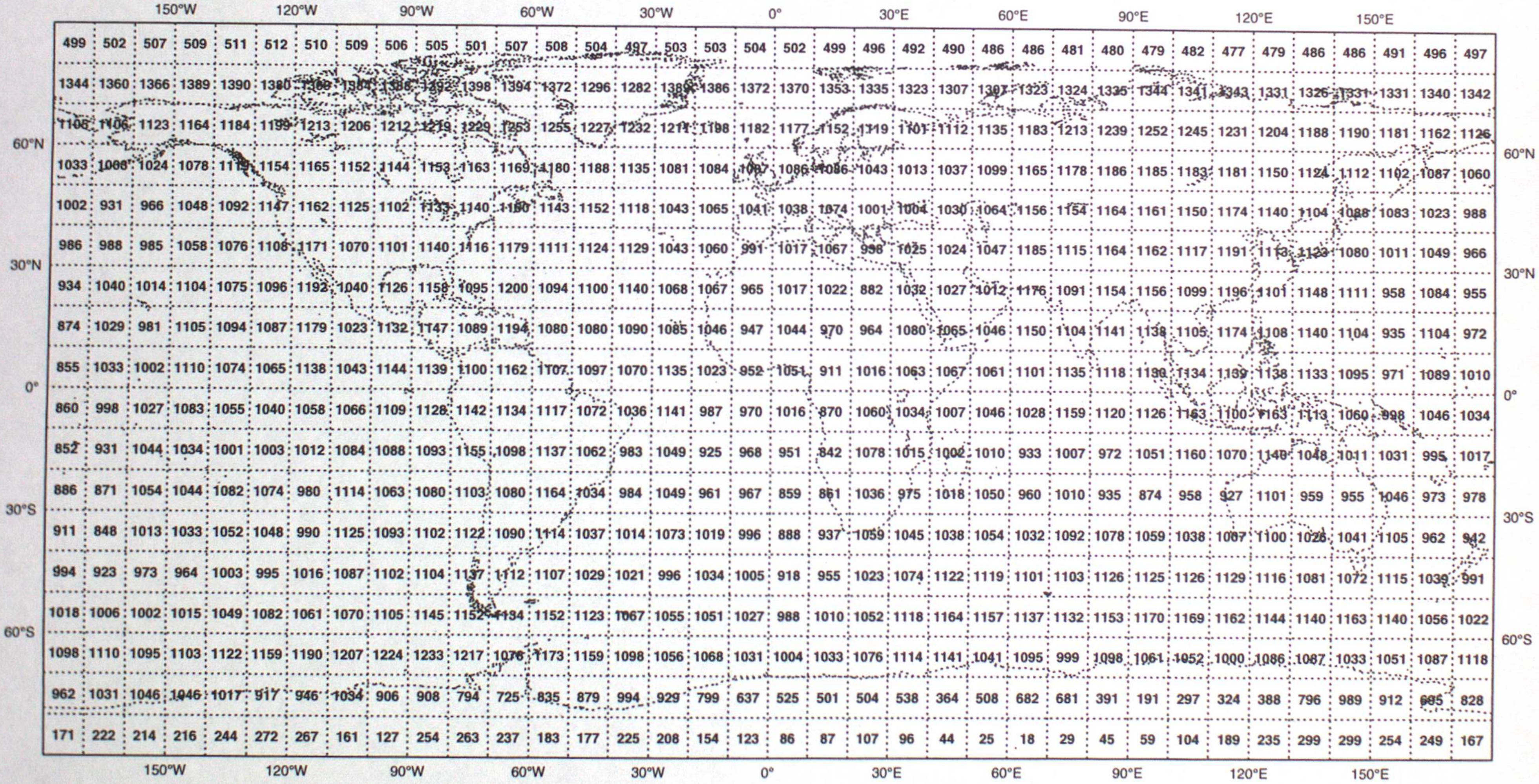
MONITORING CENTRE: EXETER

MONTH: Jul 04

Monitoring procedures

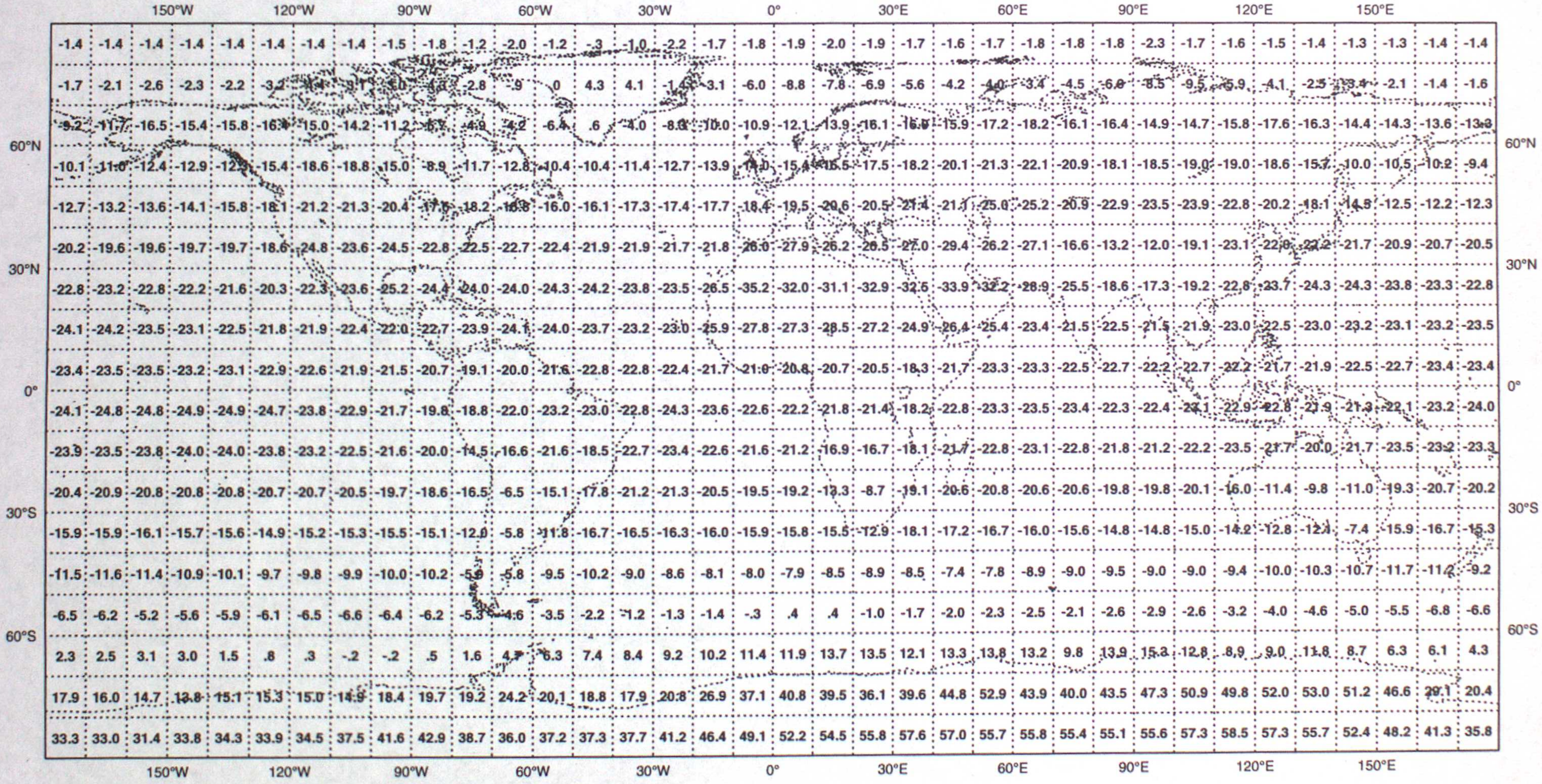
Period	:One calendar month.
Data monitored	:Reports from NOAA-15, NOAA-16 and NOAA-17.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:All soundings.
Data Extracted	:Sounding channels (and approximate weighting function peaks, hPa) HIRS8 (Surface) HIRS15 (700) HIRS11 (500-700) HIRS4 (400) AMSUA5 (700) AMSUA7 (300) AMSUA9 (100)
	:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. JULY 2004
NOAA15, using all observations
Global average number of observations in 24 hours = 641238



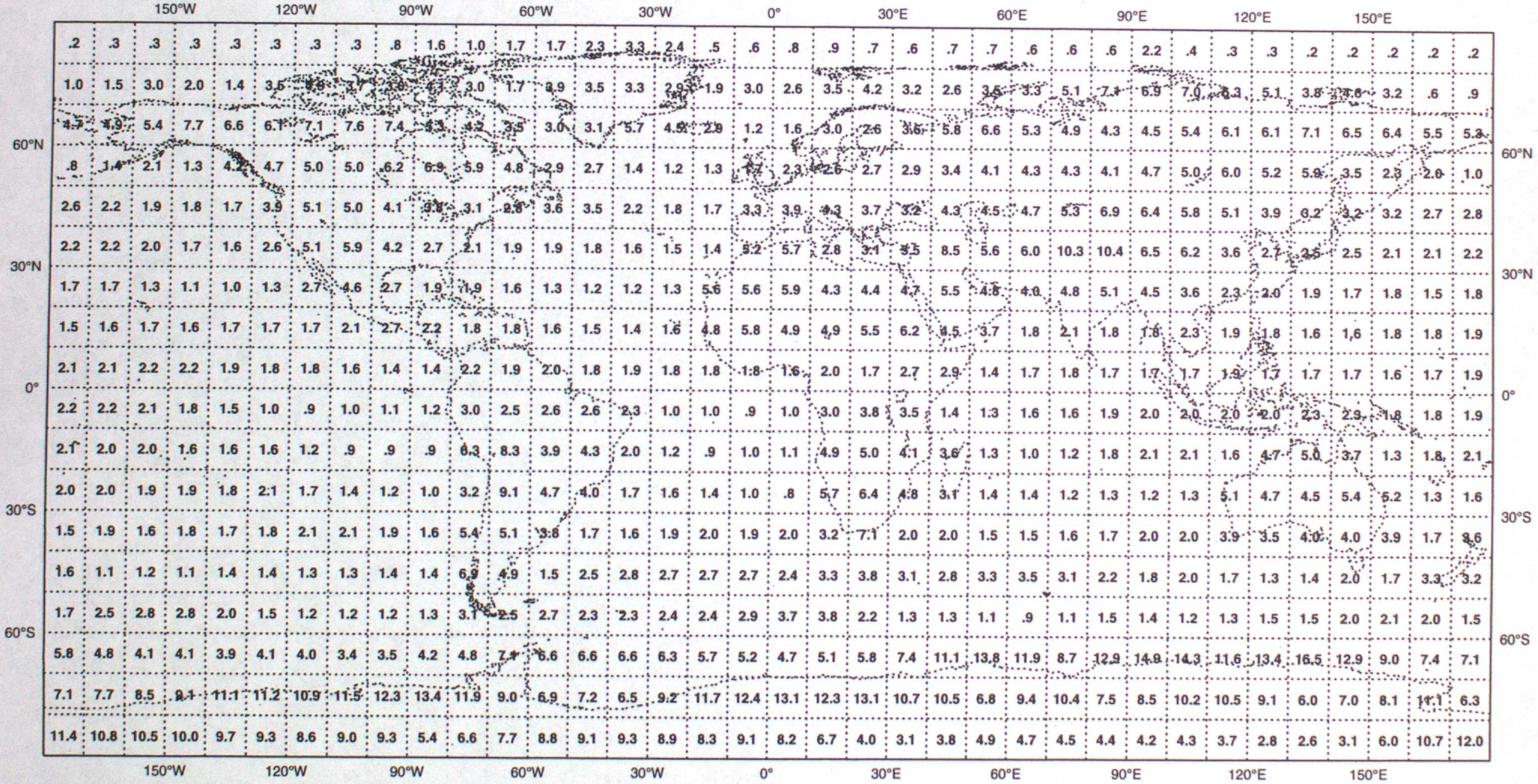
499	502	507	509	511	512	510	509	506	505	501	507	508	504	497	503	503	504	502	499	496	492	490	486	486	481	480	479	482	477	479	486	486	491	496	497
1344	1360	1366	1389	1390	1380	1388	1384	1388	1392	1398	1394	1372	1296	1282	1389	1386	1372	1370	1353	1335	1323	1307	1307	1323	1324	1335	1344	1341	1343	1331	1326	1331	1331	1340	1342
1106	1106	1123	1164	1184	1199	1213	1206	1212	1219	1229	1253	1255	1227	1232	1211	1198	1182	1177	1152	1119	1101	1112	1135	1183	1213	1239	1252	1245	1231	1204	1188	1190	1181	1162	1126
1033	1068	1024	1078	1119	1154	1165	1152	1144	1153	1163	1169	1180	1188	1135	1081	1084	1087	1086	1086	1043	1013	1037	1099	1165	1178	1186	1185	1183	1181	1150	1124	1112	1102	1087	1060
1002	931	966	1048	1092	1147	1162	1125	1102	1133	1140	1180	1143	1152	1118	1043	1065	1041	1038	1074	1001	1004	1030	1064	1156	1154	1164	1161	1150	1174	1140	1104	1088	1083	1023	988
986	988	985	1058	1076	1108	1171	1070	1101	1140	1116	1179	1111	1124	1129	1043	1060	991	1017	1067	998	1025	1024	1047	1185	1115	1164	1162	1117	1191	1113	1123	1080	1011	1049	966
934	1040	1014	1104	1075	1096	1192	1040	1126	1158	1095	1200	1094	1100	1140	1068	1067	965	1017	1022	882	1032	1027	1012	1176	1091	1154	1156	1099	1196	1101	1148	1111	958	1084	955
874	1029	981	1105	1094	1087	1179	1023	1132	1147	1089	1194	1080	1080	1090	1085	1046	947	1044	970	964	1080	1065	1046	1150	1104	1141	1138	1105	1174	1108	1140	1104	935	1104	972
855	1033	1002	1110	1074	1065	1138	1043	1144	1139	1100	1162	1107	1097	1070	1135	1023	952	1051	911	1016	1063	1067	1061	1101	1135	1118	1139	1134	1139	1138	1133	1095	971	1089	1010
860	998	1027	1083	1055	1040	1058	1066	1109	1128	1142	1134	1117	1072	1036	1141	987	970	1016	870	1060	1034	1007	1046	1028	1159	1120	1126	1163	1100	1163	1113	1060	998	1046	1034
852	931	1044	1034	1001	1003	1012	1084	1088	1093	1155	1098	1137	1062	983	1049	925	968	951	842	1078	1015	1002	1010	933	1007	972	1051	1160	1070	1140	1048	1011	1031	995	1017
886	871	1054	1044	1082	1074	980	1114	1063	1080	1103	1080	1164	1034	984	1049	961	967	859	861	1036	975	1018	1050	960	1010	935	874	958	927	1101	959	955	1046	973	978
911	848	1013	1033	1052	1048	990	1125	1093	1102	1122	1090	1114	1037	1014	1073	1019	996	888	937	1059	1045	1038	1054	1032	1092	1078	1059	1038	1067	1100	1026	1041	1105	962	942
994	923	973	964	1003	995	1016	1087	1102	1104	1137	1112	1107	1029	1021	996	1034	1005	918	955	1023	1074	1122	1119	1101	1103	1126	1125	1126	1129	1116	1081	1072	1115	1039	991
1018	1006	1002	1015	1049	1082	1061	1070	1105	1145	1152	1134	1152	1123	1067	1055	1051	1027	988	1010	1052	1118	1164	1157	1137	1132	1153	1170	1169	1162	1144	1140	1163	1140	1056	1022
1098	1110	1095	1103	1122	1159	1190	1207	1224	1233	1217	1076	1173	1159	1098	1056	1068	1031	1004	1033	1076	1114	1141	1041	1095	999	1098	1061	1052	1000	1086	1087	1033	1051	1087	1118
962	1031	1046	1046	1017	917	946	1034	906	908	794	725	835	879	994	929	799	637	525	501	504	538	364	508	682	681	391	191	297	324	388	796	989	912	985	828
171	222	214	216	244	272	267	161	127	254	263	237	183	177	225	208	154	123	86	87	107	96	44	25	18	29	45	59	104	189	235	299	299	254	249	167

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations



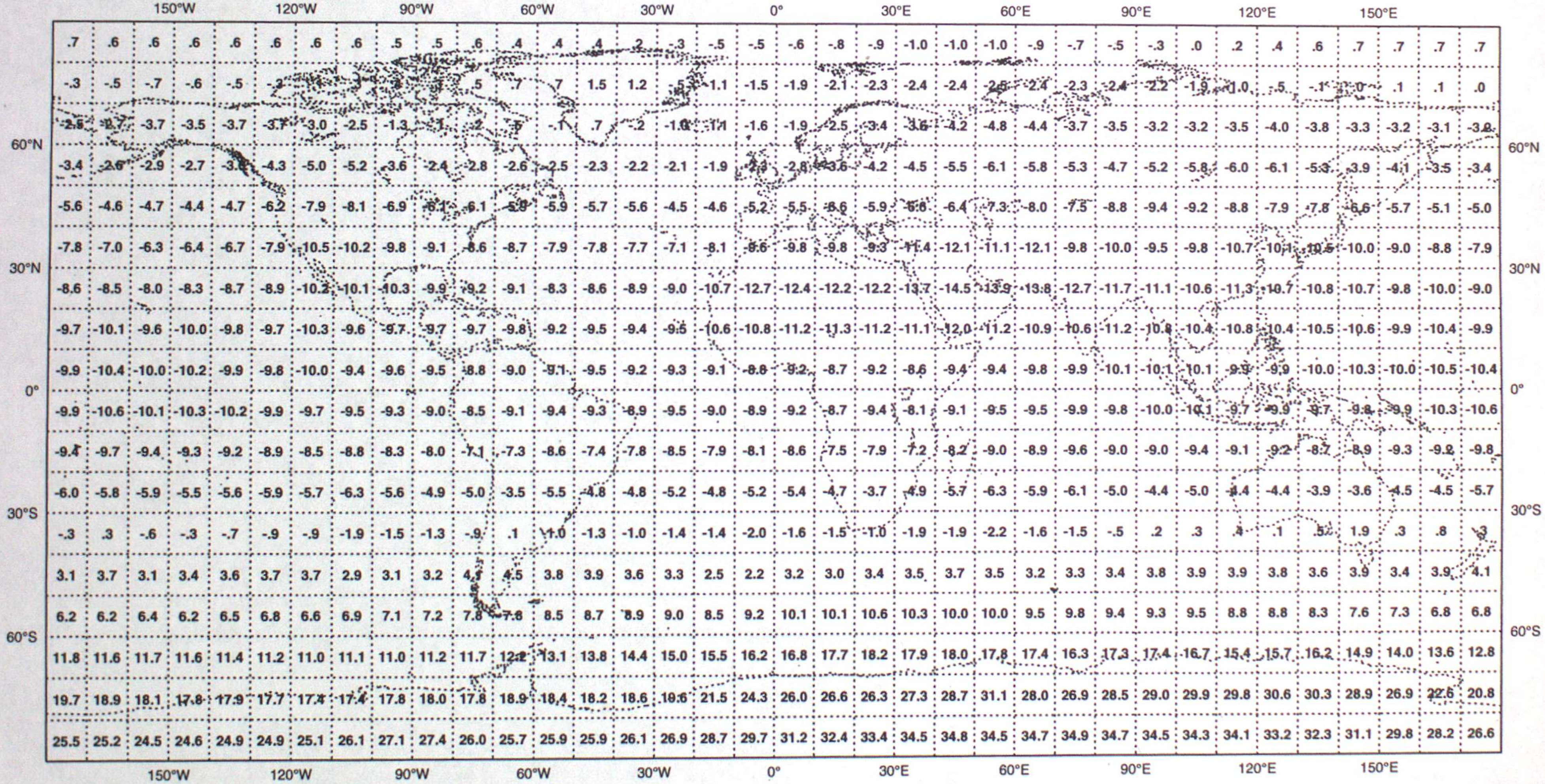
-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.5	-1.8	-1.2	-2.0	-1.2	-.3	-1.0	-2.2	-1.7	-1.8	-1.9	-2.0	-1.9	-1.7	-1.6	-1.7	-1.8	-1.8	-1.8	-2.3	-1.7	-1.6	-1.5	-1.4	-1.3	-1.3	-1.4	-1.4
-1.7	-2.1	-2.6	-2.3	-2.2	-3.2	-4.4	-3.1	-5.0	[illegible]	-2.8	-.9	0	4.3	4.1	-1.4	-3.1	-6.0	-8.8	-7.8	-6.9	-5.6	-4.2	-4.0	-3.4	-4.5	-6.8	-8.5	-9.5	-5.9	-4.1	-2.5	-3.4	-2.1	-1.4	-1.6
-9.2	-11.7	-16.5	-15.4	-15.8	-16.4	-15.0	-14.2	-11.2	-6.7	-4.9	-4.2	-6.4	.6	-4.0	-8.8	-10.0	-10.9	-12.1	-13.9	-16.1	-16.0	-15.9	-17.2	-18.2	-16.1	-16.4	-14.9	-14.7	-15.8	-17.6	-16.3	-14.4	-14.3	-13.6	-13.3
-10.1	-11.0	-12.4	-12.9	-12.3	-15.4	-18.6	-18.8	-15.0	-8.9	-11.7	-12.8	-10.4	-10.4	-11.4	-12.7	-13.9	-14.0	-15.4	-15.5	-17.5	-18.2	-20.1	-21.3	-22.1	-20.9	-18.1	-18.5	-19.0	-19.0	-18.6	-15.7	-10.0	-10.5	-10.2	-9.4
-12.7	-13.2	-13.6	-14.1	-15.8	-18.1	-21.2	-21.3	-20.4	-17.6	-18.2	-16.8	-16.0	-16.1	-17.3	-17.4	-17.7	-18.4	-19.5	-20.6	-20.5	-21.4	-21.1	-25.0	-25.2	-20.9	-22.9	-23.5	-23.9	-22.8	-20.2	-18.1	-14.8	-12.5	-12.2	-12.3
-20.2	-19.6	-19.6	-19.7	-19.7	-18.6	-24.8	-23.6	-24.5	-22.8	-22.5	-22.7	-22.4	-21.9	-21.9	-21.7	-21.8	-26.0	-27.9	-26.2	-26.5	-27.0	-29.4	-26.2	-27.1	-16.6	-13.2	-12.0	-19.1	-23.1	-22.8	-22.2	-21.7	-20.9	-20.7	-20.5
-22.8	-23.2	-22.8	-22.2	-21.6	-20.3	-22.3	-23.6	-25.2	-24.4	-24.0	-24.0	-24.3	-24.2	-23.8	-23.5	-26.5	-35.2	-32.0	-31.1	-32.9	-32.5	-33.9	-32.2	-28.9	-25.5	-18.6	-17.3	-19.2	-22.8	-23.7	-24.3	-24.3	-23.8	-23.3	-22.8
-24.1	-24.2	-23.5	-23.1	-22.5	-21.8	-21.9	-22.4	-22.0	-22.7	-23.9	-24.1	-24.0	-23.7	-23.2	-23.0	-25.9	-27.8	-27.3	-28.5	-27.2	-24.9	-26.4	-25.4	-23.4	-21.5	-22.5	-21.5	-21.9	-23.0	-22.5	-23.0	-23.2	-23.1	-23.2	-23.5
-23.4	-23.5	-23.5	-23.2	-23.1	-22.9	-22.6	-21.9	-21.5	-20.7	-19.1	-20.0	-21.6	-22.8	-22.8	-22.4	-21.7	-21.0	-20.8	-20.7	-20.5	-18.3	-21.7	-23.3	-23.3	-22.5	-22.7	-22.2	-22.7	-22.2	-21.7	-21.9	-22.5	-22.7	-23.4	-23.4
-24.1	-24.8	-24.8	-24.9	-24.9	-24.7	-23.8	-22.9	-21.7	-19.8	-18.8	-22.0	-23.2	-23.0	-22.8	-24.3	-23.6	-22.6	-22.2	-21.8	-21.4	-18.2	-22.8	-23.3	-23.5	-23.4	-22.3	-22.4	-23.1	-22.9	-22.8	-21.9	-21.3	-22.1	-23.2	-24.0
-23.9	-23.5	-23.8	-24.0	-24.0	-23.8	-23.2	-22.5	-21.6	-20.0	-14.5	-16.6	-21.6	-18.5	-22.7	-23.4	-22.6	-21.6	-21.2	-16.9	-16.7	-18.1	-21.7	-22.8	-23.1	-22.8	-21.8	-21.2	-22.2	-23.5	-21.7	-20.0	-21.7	-23.5	-23.2	-23.3
-20.4	-20.9	-20.8	-20.8	-20.8	-20.7	-20.7	-20.5	-19.7	-18.6	-16.5	-6.5	-15.1	-17.8	-21.2	-21.3	-20.5	-19.5	-19.2	-13.3	-8.7	-19.1	-20.6	-20.8	-20.6	-20.6	-19.8	-19.8	-20.1	-16.0	-11.4	-9.8	-11.0	-19.3	-20.7	-20.2
-15.9	-15.9	-16.1	-15.7	-15.6	-14.9	-15.2	-15.3	-15.5	-15.1	-12.0	-5.8	-11.8	-16.7	-16.5	-16.3	-16.0	-15.9	-15.8	-15.5	-12.9	-18.1	-17.2	-16.7	-16.0	-15.6	-14.8	-14.8	-15.0	-14.2	-12.8	-12.1	-7.4	-15.9	-16.7	-15.3
-11.5	-11.6	-11.4	-10.9	-10.1	-9.7	-9.8	-9.9	-10.0	-10.2	-5.9	-5.8	-9.5	-10.2	-9.0	-8.6	-8.1	-8.0	-7.9	-8.5	-8.9	-8.5	-7.4	-7.8	-8.9	-9.0	-9.5	-9.0	-9.0	-9.4	-10.0	-10.3	-10.7	-11.7	-11.2	-9.2
-6.5	-6.2	-5.2	-5.6	-5.9	-6.1	-6.5	-6.6	-6.4	-6.2	-5.3	-4.6	-3.5	-2.2	-1.2	-1.3	-1.4	-.3	.4	.4	-1.0	-1.7	-2.0	-2.3	-2.5	-2.1	-2.6	-2.9	-2.6	-3.2	-4.0	-4.6	-5.0	-5.5	-6.8	-6.6
2.3	2.5	3.1	3.0	1.5	.8	.3	-.2	-.2	.5	1.6	4.7	6.3	7.4	8.4	9.2	10.2	11.4	11.9	13.7	13.5	12.1	13.3	13.8	13.2	9.8	13.9	15.3	12.8	8.9	9.0	11.8	8.7	6.3	6.1	4.3
17.9	16.0	14.7	13.8	15.1	15.3	15.0	14.9	18.4	19.7	19.2	24.2	20.1	18.8	17.9	20.8	26.9	37.1	40.8	39.5	36.1	39.6	44.8	52.9	43.9	40.0	43.5	47.3	50.9	49.8	52.0	53.0	51.2	46.6	29.1	20.4
33.3	33.0	31.4	33.8	34.3	33.9	34.5	37.5	41.6	42.9	38.7	36.0	37.2	37.3	37.7	41.2	46.4	49.1	52.2	54.5	55.8	57.6	57.0	55.7	55.8	55.4	55.1	55.6	57.3	58.5	57.3	55.7	52.4	48.2	41.3	35.8

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations



.2	.3	.3	.3	.3	.3	.3	.3	.8	1.6	1.0	1.7	1.7	2.3	3.3	2.4	.5	.6	.8	.9	.7	.6	.7	.7	.6	.6	.6	2.2	.4	.3	.3	.2	.2	.2	.2	.2
1.0	1.5	3.0	2.0	1.4	3.5	3.8	3.7	3.8	4.1	3.0	1.7	3.9	3.5	3.3	2.9	1.9	3.0	2.6	3.5	4.2	3.2	2.6	3.5	3.3	5.1	7.4	6.9	7.0	6.3	5.1	3.8	3.6	3.2	.6	.9
4.7	4.9	5.4	7.7	6.6	6.1	7.1	7.6	7.4	5.3	4.2	3.5	3.0	3.1	5.7	4.5	2.9	1.2	1.6	3.0	2.6	3.6	5.8	6.6	5.3	4.9	4.3	4.5	5.4	6.1	6.1	7.1	6.5	6.4	5.5	5.3
.8	1.4	2.1	1.3	4.2	4.7	5.0	5.0	6.2	6.9	5.9	4.8	2.9	2.7	1.4	1.2	1.3	1.7	2.3	2.6	2.7	2.9	3.4	4.1	4.3	4.3	4.1	4.7	5.0	6.0	5.2	5.9	3.5	2.3	2.0	1.0
2.6	2.2	1.9	1.8	1.7	3.9	5.1	5.0	4.1	3.8	3.1	2.8	3.6	3.5	2.2	1.8	1.7	3.3	3.9	4.3	3.7	3.2	4.3	4.5	4.7	5.3	6.9	6.4	5.8	5.1	3.9	6.2	3.2	3.2	2.7	2.8
2.2	2.2	2.0	1.7	1.6	2.6	5.1	5.9	4.2	2.7	2.1	1.9	1.9	1.8	1.6	1.5	1.4	5.2	5.7	2.8	3.1	3.5	8.5	5.6	6.0	10.3	10.4	6.5	6.2	3.6	2.7	2.5	2.5	2.1	2.1	2.2
1.7	1.7	1.3	1.1	1.0	1.3	2.7	4.6	2.7	1.9	1.9	1.6	1.3	1.2	1.2	1.3	5.6	5.6	5.9	4.3	4.4	4.7	5.5	4.8	4.0	4.8	5.1	4.5	3.6	2.3	2.0	1.9	1.7	1.8	1.5	1.8
1.5	1.6	1.7	1.6	1.7	1.7	1.7	2.1	2.7	2.2	1.8	1.8	1.6	1.5	1.4	1.6	4.8	5.8	4.9	4.9	5.5	6.2	4.5	3.7	1.8	2.1	1.8	1.8	2.3	1.9	1.8	1.6	1.6	1.8	1.8	1.9
2.1	2.1	2.2	2.2	1.9	1.8	1.8	1.6	1.4	1.4	2.2	1.9	2.0	1.8	1.9	1.8	1.8	1.8	1.6	2.0	1.7	2.7	2.9	1.4	1.7	1.8	1.7	1.7	1.7	1.9	1.7	1.7	1.7	1.6	1.7	1.9
2.2	2.2	2.1	1.8	1.5	1.0	.9	1.0	1.1	1.2	3.0	2.5	2.6	2.6	2.3	1.0	1.0	.9	1.0	3.0	3.8	3.5	1.4	1.3	1.6	1.6	1.9	2.0	2.0	2.0	2.0	2.3	2.9	1.8	1.8	1.9
2.1	2.0	2.0	1.6	1.6	1.6	1.2	.9	.9	.9	6.3	8.3	3.9	4.3	2.0	1.2	.9	1.0	1.1	4.9	5.0	4.1	3.6	1.3	1.0	1.2	1.8	2.1	2.1	1.6	4.7	5.0	3.7	1.3	1.8	2.1
2.0	2.0	1.9	1.9	1.8	2.1	1.7	1.4	1.2	1.0	3.2	9.1	4.7	4.0	1.7	1.6	1.4	1.0	.8	5.7	6.4	4.8	3.1	1.4	1.4	1.2	1.3	1.2	1.3	5.1	4.7	4.5	5.4	5.2	1.3	1.6
1.5	1.9	1.6	1.8	1.7	1.8	2.1	2.1	1.9	1.6	5.4	5.1	3.8	1.7	1.6	1.9	2.0	1.9	2.0	3.2	7.1	2.0	2.0	1.5	1.5	1.6	1.7	2.0	2.0	3.9	3.5	4.0	4.0	3.9	1.7	3.6
1.6	1.1	1.2	1.1	1.4	1.4	1.3	1.3	1.4	1.4	6.9	4.9	1.5	2.5	2.8	2.7	2.7	2.7	2.4	3.3	3.8	3.1	2.8	3.3	3.5	3.1	2.2	1.8	2.0	1.7	1.3	1.4	2.0	1.7	3.3	3.2
1.7	2.5	2.8	2.8	2.0	1.5	1.2	1.2	1.2	1.3	3.1	2.5	2.7	2.3	2.3	2.4	2.4	2.9	3.7	3.8	2.2	1.3	1.3	1.1	.9	1.1	1.5	1.4	1.2	1.3	1.5	1.5	2.0	2.1	2.0	1.5
5.8	4.8	4.1	4.1	3.9	4.1	4.0	3.4	3.5	4.2	4.8	7.4	6.6	6.6	6.6	6.3	5.7	5.2	4.7	5.1	5.8	7.4	11.1	13.8	11.9	8.7	12.9	14.9	14.3	11.6	13.4	16.5	12.9	9.0	7.4	7.1
7.1	7.7	8.5	9.1	11.1	11.2	10.9	11.5	12.3	13.4	11.9	9.0	6.9	7.2	6.5	9.2	11.7	12.4	13.1	12.3	13.1	10.7	10.5	6.8	9.4	10.4	7.5	8.5	10.2	10.5	9.1	6.0	7.0	8.1	11.1	6.3
11.4	10.8	10.5	10.0	9.7	9.3	8.6	9.0	9.3	5.4	6.6	7.7	8.8	9.1	9.3	8.9	8.3	9.1	8.2	6.7	4.0	3.1	3.8	4.9	4.7	4.5	4.4	4.2	4.3	3.7	2.8	2.6	3.1	6.0	10.7	12.0

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



.7	.6	.6	.6	.6	.6	.6	.6	.5	.5	.6	.4	.4	.4	.2	-.3	-.5	-.5	-.6	-.8	-.9	-1.0	-1.0	-1.0	-.9	-.7	-.5	-.3	.0	.2	.4	.6	.7	.7	.7	.7
-.3	-.5	-.7	-.6	-.5	-.2	[illegible]	[illegible]	[illegible]	[illegible]	.5	.7	.7	1.5	1.2	-.5	-1.1	-1.5	-1.9	-2.1	-2.3	-2.4	-2.4	-2.5	-2.4	-2.3	-2.4	-2.2	-1.9	-1.0	-.5	-.1	.0	.1	.1	.0
-2.5	-2.7	-3.7	-3.5	-3.7	-3.7	-3.0	-2.5	-1.3	-.1	.2	.5	-.1	.7	-.2	-1.0	-1.1	-1.6	-1.9	-2.5	-3.4	-3.6	-4.2	-4.8	-4.4	-3.7	-3.5	-3.2	-3.2	-3.5	-4.0	-3.8	-3.3	-3.2	-3.1	-3.2
-3.4	-2.6	-2.9	-2.7	[illegible]	-4.3	-5.0	-5.2	-3.6	-2.4	-2.8	-2.6	-2.5	-2.3	-2.2	-2.1	-1.9	-2.3	-2.8	-3.6	-4.2	-4.5	-5.5	-6.1	-5.8	-5.3	-4.7	-5.2	-5.8	-6.0	-6.1	-5.3	-3.9	-4.1	-3.5	-3.4
-5.6	-4.6	-4.7	-4.4	-4.7	-6.2	-7.9	-8.1	-6.9	-6.1	-6.1	-5.8	-5.9	-5.7	-5.6	-4.5	-4.6	-5.2	-5.5	-6.6	-5.9	-6.6	-6.4	-7.3	-8.0	-7.5	-8.8	-9.4	-9.2	-8.8	-7.9	-7.8	-6.6	-5.7	-5.1	-5.0
-7.8	-7.0	-6.3	-6.4	-6.7	-7.9	-10.5	-10.2	-9.8	-9.1	-8.6	-8.7	-7.9	-7.8	-7.7	-7.1	-8.1	-8.6	-9.8	-9.8	-9.3	-11.4	-12.1	-11.1	-12.1	-9.8	-10.0	-9.5	-9.8	-10.7	-10.1	-10.5	-10.0	-9.0	-8.8	-7.9
-8.6	-8.5	-8.0	-8.3	-8.7	-8.9	-10.2	-10.1	-10.3	-9.9	-9.2	-9.1	-8.3	-8.6	-8.9	-9.0	-10.7	-12.7	-12.4	-12.2	-12.2	-13.7	-14.5	-13.9	-13.8	-12.7	-11.7	-11.1	-10.6	-11.3	-10.7	-10.8	-10.7	-9.8	-10.0	-9.0
-9.7	-10.1	-9.6	-10.0	-9.8	-9.7	-10.3	-9.6	-9.7	-9.7	-9.7	-9.8	-9.2	-9.5	-9.4	-9.5	-10.6	-10.8	-11.2	-11.3	-11.2	-11.1	-12.0	-11.2	-10.9	-10.6	-11.2	-10.8	-10.4	-10.8	-10.4	-10.5	-10.6	-9.9	-10.4	-9.9
-9.9	-10.4	-10.0	-10.2	-9.9	-9.8	-10.0	-9.4	-9.6	-9.5	-8.8	-9.0	-9.1	-9.5	-9.2	-9.3	-9.1	-8.8	-9.2	-8.7	-9.2	-8.6	-9.4	-9.4	-9.8	-9.9	-10.1	-10.1	-10.1	-9.9	-9.9	-10.0	-10.3	-10.0	-10.5	-10.4
-9.9	-10.6	-10.1	-10.3	-10.2	-9.9	-9.7	-9.5	-9.3	-9.0	-8.5	-9.1	-9.4	-9.3	-8.9	-9.5	-9.0	-8.9	-9.2	-8.7	-9.4	-8.1	-9.1	-9.5	-9.5	-9.9	-9.8	-10.0	-10.1	-9.7	-9.9	-9.7	-9.8	-9.9	-10.3	-10.6
-9.4	-9.7	-9.4	-9.3	-9.2	-8.9	-8.5	-8.8	-8.3	-8.0	-7.1	-7.3	-8.6	-7.4	-7.8	-8.5	-7.9	-8.1	-8.6	-7.5	-7.9	-7.2	-8.2	-9.0	-8.9	-9.6	-9.0	-9.0	-9.4	-9.1	-9.2	-8.7	-8.9	-9.3	-9.2	-9.8
-6.0	-5.8	-5.9	-5.5	-5.6	-5.9	-5.7	-6.3	-5.6	-4.9	-5.0	-3.5	-5.5	-4.8	-4.8	-5.2	-4.8	-5.2	-5.4	-4.7	-3.7	-4.9	-5.7	-6.3	-5.9	-6.1	-5.0	-4.4	-5.0	-4.4	-4.4	-3.9	-3.6	-4.5	-4.5	-5.7
-.3	.3	-.6	-.3	-.7	-.9	-.9	-1.9	-1.5	-1.3	-.9	.1	-1.0	-1.3	-1.0	-1.4	-1.4	-2.0	-1.6	-1.5	-1.0	-1.9	-1.9	-2.2	-1.6	-1.5	-.5	.2	.3	.4	.1	.5	1.9	.3	.8	.3
3.1	3.7	3.1	3.4	3.6	3.7	3.7	2.9	3.1	3.2	4.1	4.5	3.8	3.9	3.6	3.3	2.5	2.2	3.2	3.0	3.4	3.5	3.7	3.5	3.2	3.3	3.4	3.8	3.9	3.9	3.8	3.6	3.9	3.4	3.9	4.1
6.2	6.2	6.4	6.2	6.5	6.8	6.6	6.9	7.1	7.2	7.8	7.8	8.5	8.7	8.9	9.0	8.5	9.2	10.1	10.1	10.6	10.3	10.0	10.0	9.5	9.8	9.4	9.3	9.5	8.8	8.8	8.3	7.6	7.3	6.8	6.8
11.8	11.6	11.7	11.6	11.4	11.2	11.0	11.1	11.0	11.2	11.7	12.2	13.1	13.8	14.4	15.0	15.5	16.2	16.8	17.7	18.2	17.9	18.0	17.8	17.4	16.3	17.3	17.4	16.7	15.4	15.7	16.2	14.9	14.0	13.6	12.8
19.7	18.9	18.1	17.8	17.9	17.7	17.4	17.4	17.8	18.0	17.8	18.9	18.4	18.2	18.6	19.6	21.5	24.3	26.0	26.6	26.3	27.3	28.7	31.1	28.0	26.9	28.5	29.0	29.9	29.8	30.6	30.3	28.9	26.9	22.6	20.8
25.5	25.2	24.5	24.6	24.9	24.9	25.1	26.1	27.1	27.4	26.0	25.7	25.9	25.9	26.1	26.9	28.7	29.7	31.2	32.4	33.4	34.5	34.8	34.5	34.7	34.9	34.7	34.5	34.3	34.1	33.2	32.3	31.1	29.8	28.2	26.6

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

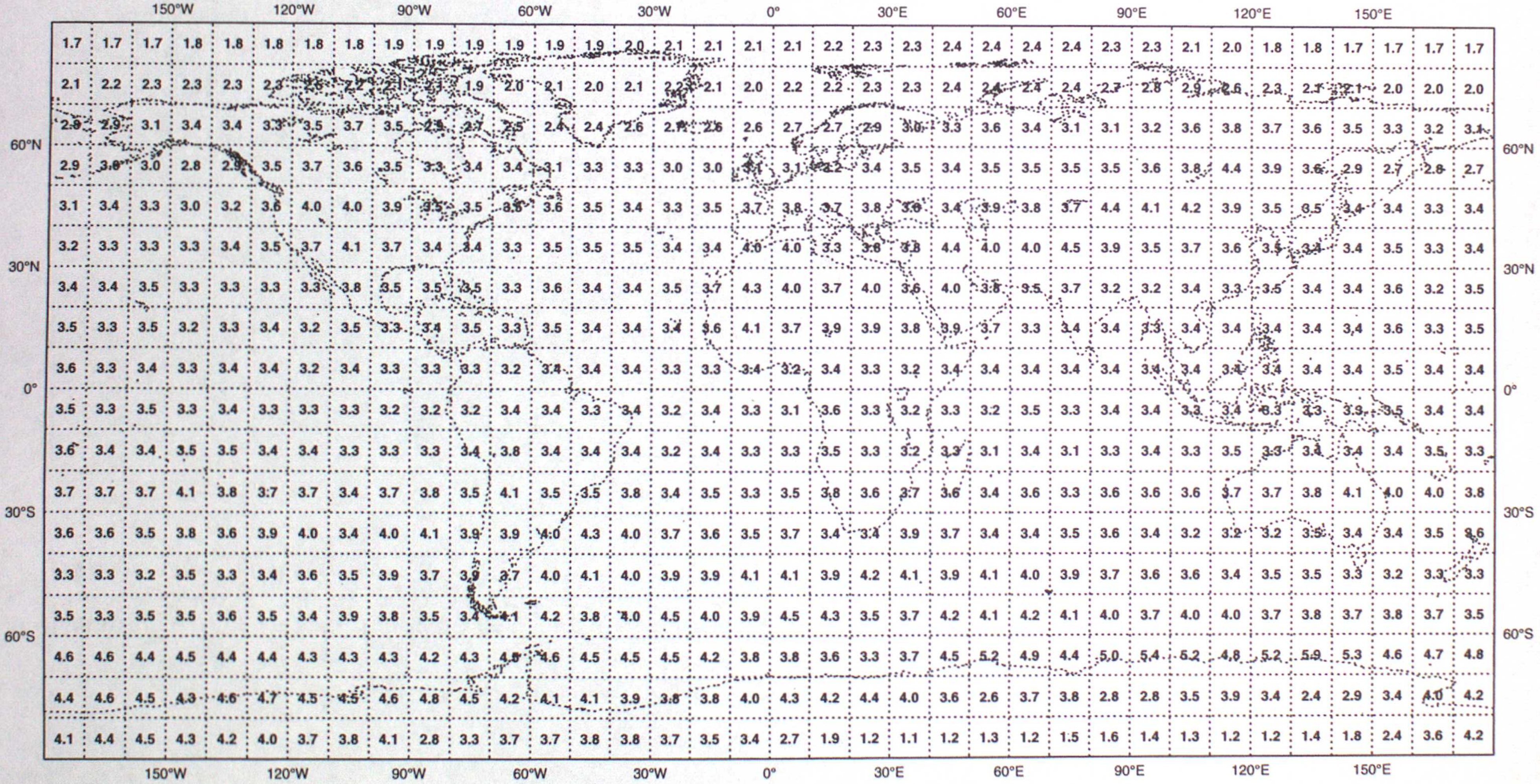
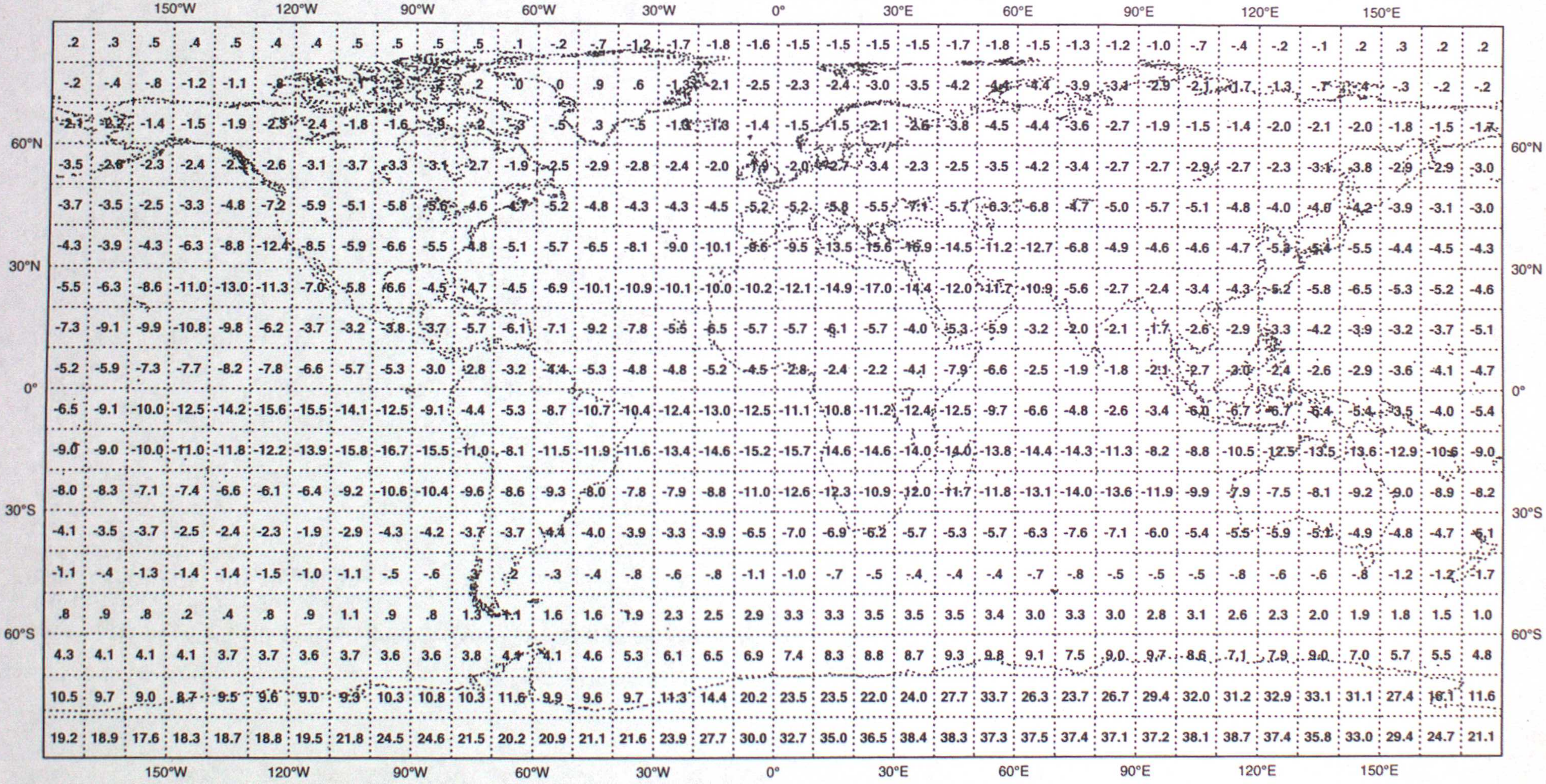
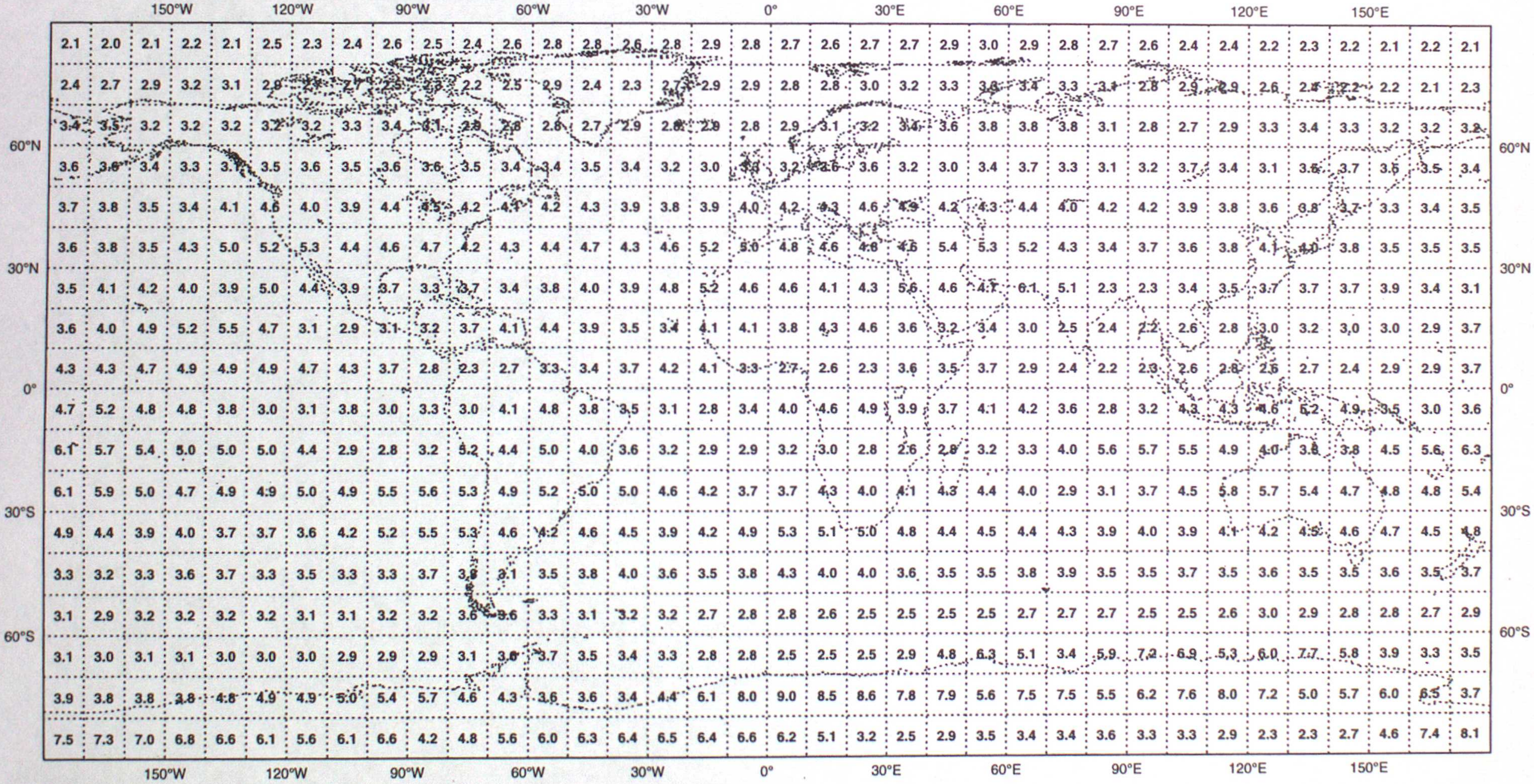

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1.7 1.7 1.7 1.8 1.8 1.8 1.8 1.8 1.9 1.9 1.9 1.9 1.9 1.9 2.0 2.1 2.1 2.1 2.1 2.2 2.3 2.3 2.4 2.4 2.4 2.4 2.3 2.3 2.1 2.0 1.8 1.8 1.7 1.7 1.7 1.7
2.1 2.2 2.3 2.3 2.3 2.3 2.6 2.2 2.1 2.1 1.9 2.0 2.1 2.0 2.1 2.2 2.1 2.0 2.2 2.2 2.3 2.3 2.4 2.4 2.4 2.4 2.7 2.8 2.9 2.6 2.3 2.1 2.1 2.0 2.0 2.0
2.9 2.9 3.1 3.4 3.4 3.3 3.5 3.7 3.5 2.9 2.7 2.5 2.4 2.4 2.6 2.7 2.6 2.6 2.7 2.7 2.9 3.0 3.3 3.6 3.4 3.1 3.1 3.2 3.6 3.8 3.7 3.6 3.5 3.3 3.2 3.1
2.9 3.0 3.0 2.8 2.9 3.5 3.7 3.6 3.5 3.3 3.4 3.4 3.1 3.3 3.3 3.0 3.0 3.1 3.1 2.2 3.4 3.5 3.4 3.5 3.5 3.5 3.5 3.6 3.8 4.4 3.9 3.6 2.9 2.7 2.8 2.7
3.1 3.4 3.3 3.0 3.2 3.6 4.0 4.0 3.9 3.5 3.5 3.5 3.6 3.5 3.4 3.3 3.5 3.7 3.8 3.7 3.8 3.6 3.4 3.9 3.8 3.7 4.4 4.1 4.2 3.9 3.5 3.5 3.4 3.4 3.3 3.4
3.2 3.3 3.3 3.3 3.4 3.5 3.7 4.1 3.7 3.4 3.4 3.3 3.5 3.5 3.5 3.4 3.4 4.0 4.0 3.3 3.6 3.8 4.4 4.0 4.0 4.5 3.9 3.5 3.7 3.6 3.5 3.4 3.4 3.5 3.3 3.4
3.4 3.4 3.5 3.3 3.3 3.3 3.3 3.8 3.5 3.5 3.5 3.3 3.6 3.4 3.4 3.5 3.7 4.3 4.0 3.7 4.0 3.6 4.0 3.8 3.5 3.7 3.2 3.2 3.4 3.3 3.5 3.4 3.4 3.6 3.2 3.5
3.5 3.3 3.5 3.2 3.3 3.4 3.2 3.5 3.3 3.4 3.5 3.3 3.5 3.4 3.4 3.4 3.6 4.1 3.7 3.9 3.9 3.8 3.9 3.7 3.3 3.4 3.4 3.3 3.4 3.4 3.4 3.4 3.4 3.6 3.3 3.5
3.6 3.3 3.4 3.3 3.4 3.4 3.2 3.4 3.3 3.3 3.3 3.2 3.4 3.4 3.4 3.3 3.3 3.4 3.2 3.4 3.3 3.2 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.5 3.4 3.4
3.5 3.3 3.5 3.3 3.4 3.3 3.3 3.3 3.2 3.2 3.2 3.4 3.4 3.3 3.4 3.2 3.4 3.3 3.1 3.6 3.3 3.2 3.3 3.2 3.5 3.3 3.4 3.4 3.3 3.4 3.3 3.3 3.9 3.5 3.4 3.4
3.6 3.4 3.4 3.5 3.5 3.4 3.4 3.3 3.3 3.3 3.4 3.8 3.4 3.4 3.4 3.2 3.4 3.3 3.3 3.5 3.3 3.2 3.3 3.1 3.4 3.1 3.3 3.4 3.3 3.5 3.3 3.4 3.4 3.4 3.5 3.3
3.7 3.7 3.7 4.1 3.8 3.7 3.7 3.4 3.7 3.8 3.5 4.1 3.5 3.5 3.8 3.4 3.5 3.3 3.5 3.8 3.6 3.7 3.6 3.4 3.6 3.3 3.6 3.6 3.6 3.7 3.7 3.8 4.1 4.0 4.0 3.8
3.6 3.6 3.5 3.8 3.6 3.9 4.0 3.4 4.0 4.1 3.9 3.9 4.0 4.3 4.0 3.7 3.6 3.5 3.7 3.4 3.4 3.9 3.7 3.4 3.4 3.5 3.6 3.4 3.2 3.2 3.2 3.5 3.4 3.4 3.5 3.6
3.3 3.3 3.2 3.5 3.3 3.4 3.6 3.5 3.9 3.7 3.9 3.7 4.0 4.1 4.0 3.9 3.9 4.1 4.1 3.9 4.2 4.1 3.9 4.1 4.0 3.9 3.7 3.6 3.6 3.4 3.5 3.5 3.3 3.2 3.3 3.3
3.5 3.3 3.5 3.5 3.6 3.5 3.4 3.9 3.8 3.5 3.4 4.1 4.2 3.8 4.0 4.5 4.0 3.9 4.5 4.3 3.5 3.7 4.2 4.1 4.2 4.1 4.0 3.7 4.0 4.0 3.7 3.8 3.7 3.8 3.7 3.5
4.6 4.6 4.4 4.5 4.4 4.4 4.3 4.3 4.3 4.2 4.3 4.5 4.6 4.5 4.5 4.5 4.2 3.8 3.8 3.6 3.3 3.7 4.5 5.2 4.9 4.4 5.0 5.4 5.2 4.8 5.2 5.9 5.3 4.6 4.7 4.8
4.4 4.6 4.5 4.3 4.6 4.7 4.5 4.5 4.6 4.8 4.5 4.2 4.1 4.1 3.9 3.8 3.8 4.0 4.3 4.2 4.4 4.0 3.6 2.6 3.7 3.8 2.8 2.8 3.5 3.9 3.4 2.4 2.9 3.4 4.0 4.2
4.1 4.4 4.5 4.3 4.2 4.0 3.7 3.8 4.1 2.8 3.3 3.7 3.7 3.8 3.8 3.7 3.5 3.4 2.7 1.9 1.2 1.1 1.2 1.3 1.2 1.5 1.6 1.4 1.3 1.2 1.2 1.4 1.8 2.4 3.6 4.2

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



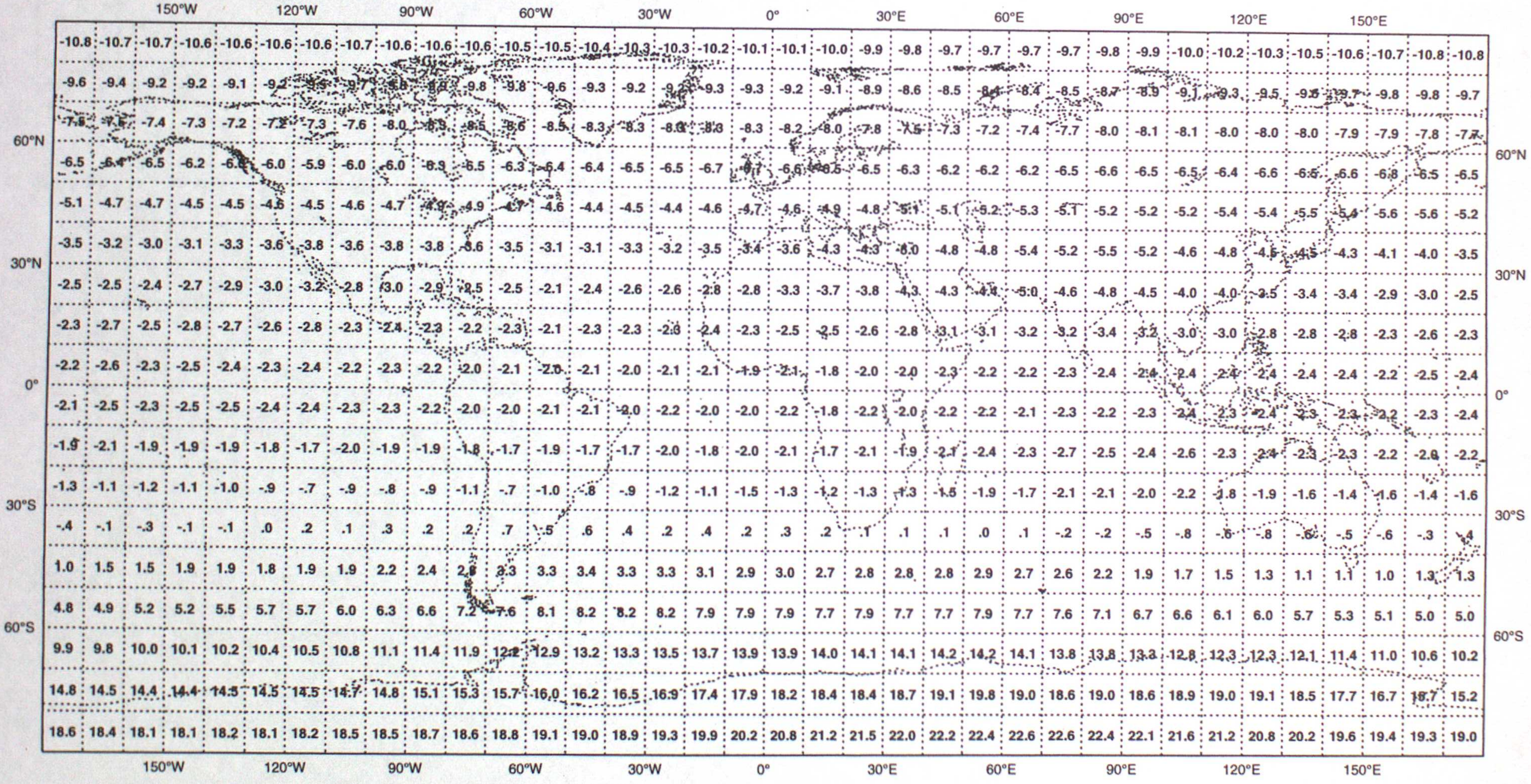
.2	.3	.5	.4	.5	.4	.4	.5	.5	.5	.5	.1	-.2	-.7	-1.2	-1.7	-1.8	-1.6	-1.5	-1.5	-1.5	-1.5	-1.7	-1.8	-1.5	-1.3	-1.2	-1.0	-.7	-.4	-.2	-.1	.2	.3	.2	.2
-.2	-.4	-.8	-1.2	-1.1	-.8	-.4	[illegible]	[illegible]	[illegible]	.2	.0	0	.9	.6	-1.3	-2.1	-2.5	-2.3	-2.4	-3.0	-3.5	-4.2	-4.4	-4.4	-3.9	-3.4	-2.9	-2.1	-1.7	-1.3	-.7	-.4	-.3	-.2	-.2
-2.1	-2.2	-1.4	-1.5	-1.9	-2.3	-2.4	-1.8	-1.6	-.9	-.2	-.3	-.5	.3	-.5	-1.8	-1.8	-1.4	-1.5	-1.5	-2.1	-2.6	-3.8	-4.5	-4.4	-3.6	-2.7	-1.9	-1.5	-1.4	-2.0	-2.1	-2.0	-1.8	-1.5	-1.7
-3.5	-2.8	-2.3	-2.4	-2.3	-2.6	-3.1	-3.7	-3.3	-3.1	-2.7	-1.9	-2.5	-2.9	-2.8	-2.4	-2.0	-1.9	-2.0	-2.7	-3.4	-2.3	-2.5	-3.5	-4.2	-3.4	-2.7	-2.7	-2.9	-2.7	-2.3	-3.1	-3.8	-2.9	-2.9	-3.0
-3.7	-3.5	-2.5	-3.3	-4.8	-7.2	-5.9	-5.1	-5.8	-5.6	-4.6	-4.7	-5.2	-4.8	-4.3	-4.3	-4.5	-5.2	-5.2	-5.8	-5.5	-7.1	-5.7	-6.3	-6.8	-4.7	-5.0	-5.7	-5.1	-4.8	-4.0	-4.0	-4.2	-3.9	-3.1	-3.0
-4.3	-3.9	-4.3	-6.3	-8.8	-12.4	-8.5	-5.9	-6.6	-5.5	-4.8	-5.1	-5.7	-6.5	-8.1	-9.0	-10.1	-8.6	-9.5	-13.5	-15.6	-16.9	-14.5	-11.2	-12.7	-6.8	-4.9	-4.6	-4.6	-4.7	-5.3	-5.4	-5.5	-4.4	-4.5	-4.3
-5.5	-6.3	-8.6	-11.0	-13.0	-11.3	-7.0	-5.8	-6.6	-4.5	-4.7	-4.5	-6.9	-10.1	-10.9	-10.1	-10.0	-10.2	-12.1	-14.9	-17.0	-14.4	-12.0	-11.7	-10.9	-5.6	-2.7	-2.4	-3.4	-4.3	-5.2	-5.8	-6.5	-5.3	-5.2	-4.6
-7.3	-9.1	-9.9	-10.8	-9.8	-6.2	-3.7	-3.2	-3.8	-3.7	-5.7	-6.1	-7.1	-9.2	-7.8	-5.5	-6.5	-5.7	-5.7	-6.1	-5.7	-4.0	-5.3	-5.9	-3.2	-2.0	-2.1	-1.7	-2.6	-2.9	-3.3	-4.2	-3.9	-3.2	-3.7	-5.1
-5.2	-5.9	-7.3	-7.7	-8.2	-7.8	-6.6	-5.7	-5.3	-3.0	-2.8	-3.2	-4.4	-5.3	-4.8	-4.8	-5.2	-4.5	-2.8	-2.4	-2.2	-4.1	-7.9	-6.6	-2.5	-1.9	-1.8	-2.1	-2.7	-3.0	-2.4	-2.6	-2.9	-3.6	-4.1	-4.7
-6.5	-9.1	-10.0	-12.5	-14.2	-15.6	-15.5	-14.1	-12.5	-9.1	-4.4	-5.3	-8.7	-10.7	-10.4	-12.4	-13.0	-12.5	-11.1	-10.8	-11.2	-12.4	-12.5	-9.7	-6.6	-4.8	-2.6	-3.4	-6.0	-6.7	-6.7	-6.4	-5.4	-3.5	-4.0	-5.4
-9.0	-9.0	-10.0	-11.0	-11.8	-12.2	-13.9	-15.8	-16.7	-15.5	-11.0	-8.1	-11.5	-11.9	-11.6	-13.4	-14.6	-15.2	-15.7	-14.6	-14.6	-14.0	-14.0	-13.8	-14.4	-14.3	-11.3	-8.2	-8.8	-10.5	-12.5	-13.5	-13.6	-12.9	-10.6	-9.0
-8.0	-8.3	-7.1	-7.4	-6.6	-6.1	-6.4	-9.2	-10.6	-10.4	-9.6	-8.6	-9.3	-8.0	-7.8	-7.9	-8.8	-11.0	-12.6	-12.3	-10.9	-12.0	-11.7	-11.8	-13.1	-14.0	-13.6	-11.9	-9.9	-7.9	-7.5	-8.1	-9.2	-9.0	-8.9	-8.2
-4.1	-3.5	-3.7	-2.5	-2.4	-2.3	-1.9	-2.9	-4.3	-4.2	-3.7	-3.7	-4.4	-4.0	-3.9	-3.3	-3.9	-6.5	-7.0	-6.9	-6.2	-5.7	-5.3	-5.7	-6.3	-7.6	-7.1	-6.0	-5.4	-5.5	-5.9	-5.1	-4.9	-4.8	-4.7	-6.1
-1.1	-.4	-1.3	-1.4	-1.4	-1.5	-1.0	-1.1	-.5	-.6	.3	.2	-.3	-.4	-.8	-.6	-.8	-1.1	-1.0	-.7	-.5	-.4	-.4	-.4	-.7	-.8	-.5	-.5	-.5	-.8	-.6	-.6	-.8	-1.2	-1.2	-1.7
.8	.9	.8	.2	.4	.8	.9	1.1	.9	.8	1.3	1.1	1.6	1.6	1.9	2.3	2.5	2.9	3.3	3.3	3.5	3.5	3.5	3.4	3.0	3.3	3.0	2.8	3.1	2.6	2.3	2.0	1.9	1.8	1.5	1.0
4.3	4.1	4.1	4.1	3.7	3.7	3.6	3.7	3.6	3.6	3.8	4.4	4.1	4.6	5.3	6.1	6.5	6.9	7.4	8.3	8.8	8.7	9.3	9.8	9.1	7.5	9.0	9.7	8.6	7.1	7.9	9.0	7.0	5.7	5.5	4.8
10.5	9.7	9.0	8.7	9.5	9.6	9.0	9.3	10.3	10.8	10.3	11.6	9.9	9.6	9.7	11.3	14.4	20.2	23.5	23.5	22.0	24.0	27.7	33.7	26.3	23.7	26.7	29.4	32.0	31.2	32.9	33.1	31.1	27.4	16.1	11.6
19.2	18.9	17.6	18.3	18.7	18.8	19.5	21.8	24.5	24.6	21.5	20.2	20.9	21.1	21.6	23.9	27.7	30.0	32.7	35.0	36.5	38.4	38.3	37.3	37.5	37.4	37.1	37.2	38.1	38.7	37.4	35.8	33.0	29.4	24.7	21.1

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



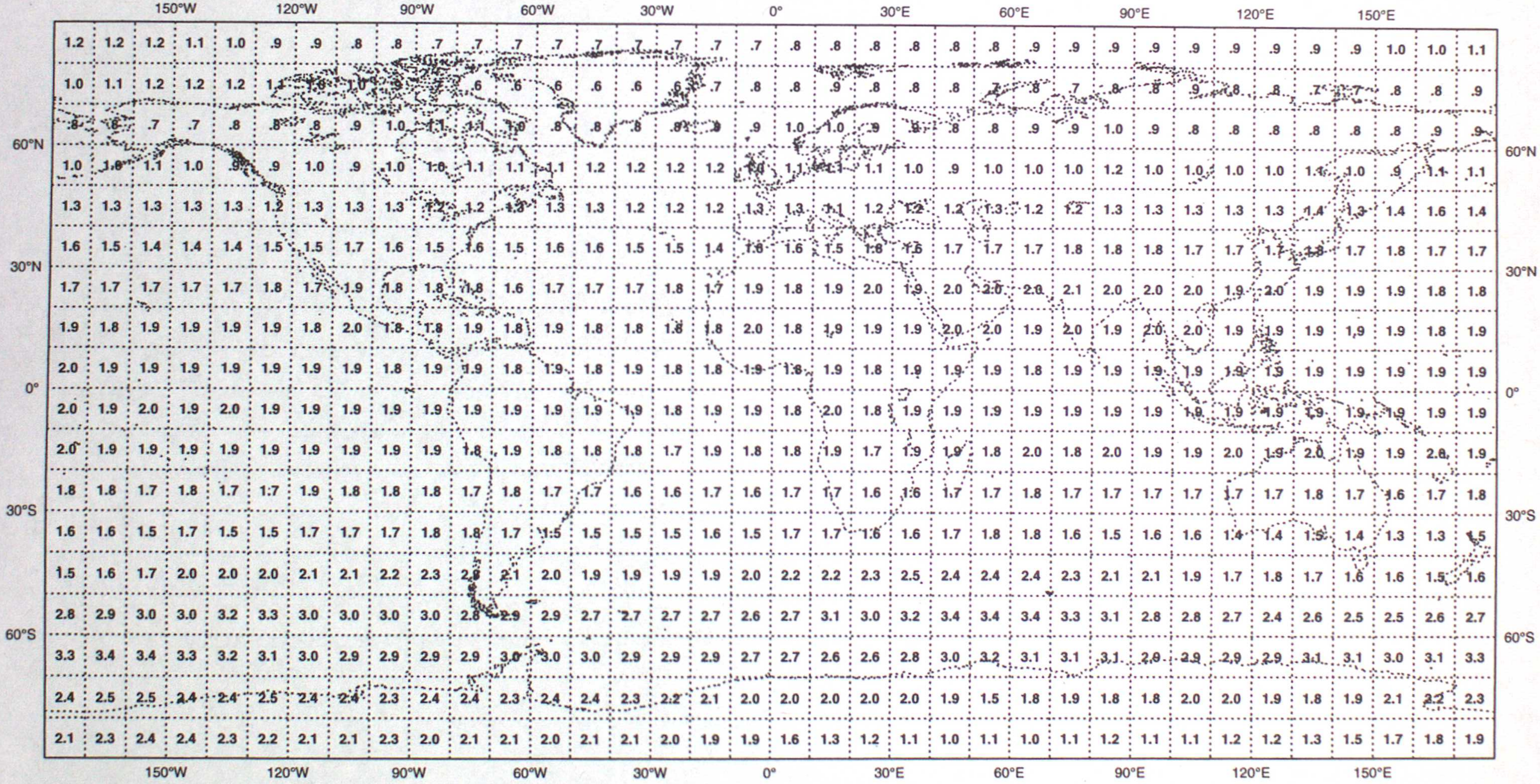
2.1	2.0	2.1	2.2	2.1	2.5	2.3	2.4	2.6	2.5	2.4	2.6	2.8	2.8	2.6	2.8	2.9	2.8	2.7	2.6	2.7	2.7	2.9	3.0	2.9	2.8	2.7	2.6	2.4	2.4	2.2	2.3	2.2	2.1	2.2	2.1
2.4	2.7	2.9	3.2	3.1	2.8	2.4	2.7	2.5	2.3	2.2	2.5	2.9	2.4	2.3	2.7	2.9	2.9	2.8	2.8	3.0	3.2	3.3	3.6	3.4	3.3	3.1	2.8	2.9	2.9	2.6	2.4	2.2	2.2	2.1	2.3
3.4	3.5	3.2	3.2	3.2	3.2	3.2	3.3	3.4	3.1	2.8	2.8	2.8	2.7	2.9	2.8	2.9	2.8	2.9	3.1	3.2	3.4	3.6	3.8	3.8	3.8	3.1	2.8	2.7	2.9	3.3	3.4	3.3	3.2	3.2	3.2
3.6	3.6	3.4	3.3	3.1	3.5	3.6	3.5	3.6	3.6	3.5	3.4	3.4	3.5	3.4	3.2	3.0	3.3	3.2	2.6	3.6	3.2	3.0	3.4	3.7	3.3	3.1	3.2	3.7	3.4	3.1	3.6	3.7	3.5	3.5	3.4
3.7	3.8	3.5	3.4	4.1	4.6	4.0	3.9	4.4	4.5	4.2	4.1	4.2	4.3	3.9	3.8	3.9	4.0	4.2	4.3	4.6	4.9	4.2	4.3	4.4	4.0	4.2	4.2	3.9	3.8	3.6	3.8	3.7	3.3	3.4	3.5
3.6	3.8	3.5	4.3	5.0	5.2	5.3	4.4	4.6	4.7	4.2	4.3	4.4	4.7	4.3	4.6	5.2	5.0	4.8	4.6	4.6	4.5	5.4	5.3	5.2	4.3	3.4	3.7	3.6	3.8	4.1	4.0	3.8	3.5	3.5	3.5
3.5	4.1	4.2	4.0	3.9	5.0	4.4	3.9	3.7	3.3	3.7	3.4	3.8	4.0	3.9	4.8	5.2	4.6	4.6	4.1	4.3	5.6	4.6	4.7	6.1	5.1	2.3	2.3	3.4	3.5	3.7	3.7	3.7	3.9	3.4	3.1
3.6	4.0	4.9	5.2	5.5	4.7	3.1	2.9	3.1	3.2	3.7	4.1	4.4	3.9	3.5	3.4	4.1	4.1	3.8	4.3	4.6	3.6	3.2	3.4	3.0	2.5	2.4	2.2	2.6	2.8	3.0	3.2	3.0	3.0	2.9	3.7
4.3	4.3	4.7	4.9	4.9	4.9	4.7	4.3	3.7	2.8	2.3	2.7	3.3	3.4	3.7	4.2	4.1	3.3	2.7	2.6	2.3	3.6	3.5	3.7	2.9	2.4	2.2	2.3	2.6	2.8	2.6	2.7	2.4	2.9	2.9	3.7
4.7	5.2	4.8	4.8	3.8	3.0	3.1	3.8	3.0	3.3	3.0	4.1	4.8	3.8	3.5	3.1	2.8	3.4	4.0	4.6	4.9	3.9	3.7	4.1	4.2	3.6	2.8	3.2	4.3	4.3	4.6	6.2	4.9	3.5	3.0	3.6
6.1	5.7	5.4	5.0	5.0	5.0	4.4	2.9	2.8	3.2	5.2	4.4	5.0	4.0	3.6	3.2	2.9	2.9	3.2	3.0	2.8	2.6	2.8	3.2	3.3	4.0	5.6	5.7	5.5	4.9	4.0	3.8	3.8	4.5	5.6	6.3
6.1	5.9	5.0	4.7	4.9	4.9	5.0	4.9	5.5	5.6	5.3	4.9	5.2	5.0	5.0	4.6	4.2	3.7	3.7	4.3	4.0	4.1	4.3	4.4	4.0	2.9	3.1	3.7	4.5	5.8	5.7	5.4	4.7	4.8	4.8	5.4
4.9	4.4	3.9	4.0	3.7	3.7	3.6	4.2	5.2	5.5	5.3	4.6	4.2	4.6	4.5	3.9	4.2	4.9	5.3	5.1	5.0	4.8	4.4	4.5	4.4	4.3	3.9	4.0	3.9	4.1	4.2	4.5	4.6	4.7	4.5	4.8
3.3	3.2	3.3	3.6	3.7	3.3	3.5	3.3	3.3	3.7	3.8	3.1	3.5	3.8	4.0	3.6	3.5	3.8	4.3	4.0	4.0	3.6	3.5	3.5	3.8	3.9	3.5	3.5	3.7	3.5	3.6	3.5	3.5	3.6	3.5	3.7
3.1	2.9	3.2	3.2	3.2	3.2	3.1	3.1	3.2	3.2	3.6	3.6	3.3	3.1	3.2	3.2	2.7	2.8	2.8	2.6	2.5	2.5	2.5	2.5	2.7	2.7	2.7	2.5	2.5	2.6	3.0	2.9	2.8	2.8	2.7	2.9
3.1	3.0	3.1	3.1	3.0	3.0	3.0	2.9	2.9	2.9	3.1	3.6	3.7	3.5	3.4	3.3	2.8	2.8	2.5	2.5	2.5	2.9	4.8	6.3	5.1	3.4	5.9	7.2	6.9	5.3	6.0	7.7	5.8	3.9	3.3	3.5
3.9	3.8	3.8	3.8	4.8	4.9	4.9	5.0	5.4	5.7	4.6	4.3	3.6	3.6	3.4	4.4	6.1	8.0	9.0	8.5	8.6	7.8	7.9	5.6	7.5	7.5	5.5	6.2	7.6	8.0	7.2	5.0	5.7	6.0	6.5	3.7
7.5	7.3	7.0	6.8	6.6	6.1	5.6	6.1	6.6	4.2	4.8	5.6	6.0	6.3	6.4	6.5	6.4	6.6	6.2	5.1	3.2	2.5	2.9	3.5	3.4	3.4	3.6	3.3	3.3	2.9	2.3	2.3	2.7	4.6	7.4	8.1

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



-10.8	-10.7	-10.7	-10.6	-10.6	-10.6	-10.6	-10.7	-10.6	-10.6	-10.6	-10.5	-10.5	-10.4	-10.3	-10.3	-10.2	-10.1	-10.1	-10.0	-9.9	-9.8	-9.7	-9.7	-9.7	-9.7	-9.8	-9.9	-10.0	-10.2	-10.3	-10.5	-10.6	-10.7	-10.8	-10.8
-9.6	-9.4	-9.2	-9.2	-9.1	-9.2	-9.5	-9.7	-9.8	-9.9	-9.8	-9.8	-9.6	-9.3	-9.2	-9.2	-9.3	-9.3	-9.2	-9.1	-8.9	-8.6	-8.5	-8.4	-8.4	-8.5	-8.7	-8.9	-9.1	-9.3	-9.5	-9.5	-9.7	-9.8	-9.8	-9.7
-7.5	-7.6	-7.4	-7.3	-7.2	-7.2	-7.3	-7.6	-8.0	-8.3	-8.5	-8.6	-8.5	-8.3	-8.3	-8.3	-8.3	-8.3	-8.2	-8.0	-7.8	-7.5	-7.3	-7.2	-7.4	-7.7	-8.0	-8.1	-8.1	-8.0	-8.0	-8.0	-7.9	-7.9	-7.8	-7.7
-6.5	-6.4	-6.5	-6.2	-6.6	-6.0	-5.9	-6.0	-6.0	-6.3	-6.5	-6.3	-6.4	-6.4	-6.5	-6.5	-6.7	-6.7	-6.6	-6.5	-6.5	-6.3	-6.2	-6.2	-6.2	-6.5	-6.6	-6.5	-6.5	-6.4	-6.6	-6.5	-6.6	-6.8	-6.5	-6.5
-5.1	-4.7	-4.7	-4.5	-4.5	-4.6	-4.5	-4.6	-4.7	-4.9	-4.9	-4.7	-4.6	-4.4	-4.5	-4.4	-4.6	-4.7	-4.6	-4.9	-4.8	-5.1	-5.1	-5.2	-5.3	-5.1	-5.2	-5.2	-5.2	-5.4	-5.4	-5.5	-5.4	-5.6	-5.6	-5.2
-3.5	-3.2	-3.0	-3.1	-3.3	-3.6	-3.8	-3.6	-3.8	-3.8	-3.6	-3.5	-3.1	-3.1	-3.3	-3.2	-3.5	-3.4	-3.6	-4.3	-4.3	-6.0	-4.8	-4.8	-5.4	-5.2	-5.5	-5.2	-4.6	-4.8	-4.5	-4.5	-4.3	-4.1	-4.0	-3.5
-2.5	-2.5	-2.4	-2.7	-2.9	-3.0	-3.2	-2.8	-3.0	-2.9	-2.5	-2.5	-2.1	-2.4	-2.6	-2.6	-2.8	-2.8	-3.3	-3.7	-3.8	-4.3	-4.3	-4.4	-5.0	-4.6	-4.8	-4.5	-4.0	-4.0	-3.5	-3.4	-3.4	-2.9	-3.0	-2.5
-2.3	-2.7	-2.5	-2.8	-2.7	-2.6	-2.8	-2.3	-2.4	-2.3	-2.2	-2.3	-2.1	-2.3	-2.3	-2.3	-2.4	-2.3	-2.5	-2.5	-2.6	-2.8	-3.1	-3.1	-3.2	-3.2	-3.4	-3.2	-3.0	-3.0	-2.8	-2.8	-2.8	-2.3	-2.6	-2.3
-2.2	-2.6	-2.3	-2.5	-2.4	-2.3	-2.4	-2.2	-2.3	-2.2	-2.0	-2.1	-2.0	-2.1	-2.0	-2.1	-2.1	-1.9	-2.1	-1.8	-2.0	-2.0	-2.3	-2.2	-2.2	-2.3	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.2	-2.5	-2.4
-2.1	-2.5	-2.3	-2.5	-2.5	-2.4	-2.4	-2.3	-2.3	-2.2	-2.0	-2.0	-2.1	-2.1	-2.0	-2.2	-2.0	-2.0	-2.2	-1.8	-2.2	-2.0	-2.2	-2.2	-2.1	-2.3	-2.2	-2.3	-2.4	-2.3	-2.4	-2.3	-2.3	-2.2	-2.3	-2.4
-1.9	-2.1	-1.9	-1.9	-1.9	-1.8	-1.7	-2.0	-1.9	-1.9	-1.8	-1.7	-1.9	-1.7	-1.7	-2.0	-1.8	-2.0	-2.1	-1.7	-2.1	-1.9	-2.1	-2.4	-2.3	-2.7	-2.5	-2.4	-2.6	-2.3	-2.4	-2.3	-2.3	-2.2	-2.8	-2.2
-1.3	-1.1	-1.2	-1.1	-1.0	-.9	-.7	-.9	-.8	-.9	-1.1	-.7	-1.0	-.8	-.9	-1.2	-1.1	-1.5	-1.3	-1.2	-1.3	-1.3	-1.5	-1.9	-1.7	-2.1	-2.1	-2.0	-2.2	-1.8	-1.9	-1.6	-1.4	-1.6	-1.4	-1.6
-.4	-.1	-.3	-.1	-.1	.0	.2	.1	.3	.2	.2	.7	.5	.6	.4	.2	.4	.2	.3	.2	.1	.1	.1	.0	.1	-.2	-.2	-.5	-.8	-.6	-.8	-.6	-.5	-.6	-.3	-.4
1.0	1.5	1.5	1.9	1.9	1.8	1.9	1.9	2.2	2.4	2.8	3.3	3.3	3.4	3.3	3.3	3.1	2.9	3.0	2.7	2.8	2.8	2.8	2.9	2.7	2.6	2.2	1.9	1.7	1.5	1.3	1.1	1.1	1.0	1.3	1.3
4.8	4.9	5.2	5.2	5.5	5.7	5.7	6.0	6.3	6.6	7.2	7.6	8.1	8.2	8.2	8.2	7.9	7.9	7.9	7.7	7.9	7.7	7.7	7.9	7.7	7.6	7.1	6.7	6.6	6.1	6.0	5.7	5.3	5.1	5.0	5.0
9.9	9.8	10.0	10.1	10.2	10.4	10.5	10.8	11.1	11.4	11.9	12.2	12.9	13.2	13.3	13.5	13.7	13.9	13.9	14.0	14.1	14.1	14.2	14.2	14.1	13.8	13.8	13.3	12.8	12.3	12.3	12.1	11.4	11.0	10.6	10.2
14.8	14.5	14.4	14.4	14.5	14.5	14.5	14.7	14.8	15.1	15.3	15.7	16.0	16.2	16.5	16.9	17.4	17.9	18.2	18.4	18.4	18.7	19.1	19.8	19.0	18.6	19.0	18.6	18.9	19.0	19.1	18.5	17.7	16.7	18.7	15.2
18.6	18.4	18.1	18.1	18.2	18.1	18.2	18.5	18.5	18.7	18.6	18.8	19.1	19.0	18.9	19.3	19.9	20.2	20.8	21.2	21.5	22.0	22.2	22.4	22.6	22.6	22.4	22.1	21.6	21.2	20.8	20.2	19.6	19.4	19.3	19.0

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



1.2	1.2	1.2	1.1	1.0	.9	.9	.8	.8	.7	.7	.7	.7	.7	.7	.7	.7	.7	.8	.8	.8	.8	.8	.8	.9	.9	.9	.9	.9	.9	.9	.9	.9	1.0	1.0	1.1
1.0	1.1	1.2	1.2	1.2	1.1	1.0	1.0	.9	.7	.6	.6	.6	.6	.6	.6	.7	.8	.8	.9	.8	.8	.8	.7	.8	.7	.8	.8	.9	.8	.8	.7	.7	.8	.8	.9
.8	.8	.7	.7	.8	.8	.8	.9	1.0	1.1	1.1	1.0	.8	.8	.8	.8	.9	.9	1.0	1.0	.9	.9	.8	.8	.9	.9	1.0	.9	.8	.8	.8	.8	.8	.8	.9	.9
1.0	1.0	1.1	1.0	.9	.9	1.0	.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.0	1.1	1.1	1.1	1.0	.9	1.0	1.0	1.0	1.2	1.0	1.0	1.0	1.0	1.1	1.0	.9	1.1	1.1
1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3	1.3	1.2	1.2	1.3	1.3	1.3	1.2	1.2	1.2	1.3	1.3	1.1	1.2	1.2	1.2	1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.3	1.4	1.6	1.4
1.6	1.5	1.4	1.4	1.4	1.5	1.5	1.7	1.6	1.5	1.6	1.5	1.6	1.6	1.5	1.5	1.4	1.6	1.6	1.5	1.8	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.7	1.7	1.7	1.8	1.7	1.8	1.7	1.7
1.7	1.7	1.7	1.7	1.7	1.8	1.7	1.9	1.8	1.8	1.8	1.6	1.7	1.7	1.7	1.8	1.7	1.9	1.8	1.9	2.0	1.9	2.0	2.0	2.0	2.1	2.0	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.8	1.8
1.9	1.8	1.9	1.9	1.9	1.9	1.8	2.0	1.8	1.8	1.9	1.8	1.9	1.8	1.8	1.8	1.8	2.0	1.8	1.9	1.9	1.9	2.0	2.0	1.9	2.0	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.8	1.9
2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.8	1.9	1.8	1.9	1.8	1.8	1.9	1.8	1.9	1.8	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
2.0	1.9	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.8	2.0	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.8	1.8	1.8	1.7	1.9	1.8	1.8	1.9	1.7	1.9	1.9	1.8	2.0	1.8	2.0	1.9	1.9	2.0	1.9	2.0	1.9	1.9	2.0	1.9
1.8	1.8	1.7	1.8	1.7	1.7	1.9	1.8	1.8	1.8	1.7	1.8	1.7	1.7	1.6	1.6	1.7	1.6	1.7	1.7	1.6	1.6	1.7	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.7	1.6	1.7	1.8
1.6	1.6	1.5	1.7	1.5	1.5	1.7	1.7	1.7	1.8	1.8	1.7	1.5	1.5	1.5	1.5	1.6	1.5	1.7	1.7	1.6	1.6	1.7	1.8	1.8	1.6	1.5	1.6	1.6	1.4	1.4	1.5	1.4	1.3	1.3	1.5
1.5	1.6	1.7	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.8	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.2	2.2	2.3	2.5	2.4	2.4	2.4	2.3	2.1	2.1	1.9	1.7	1.8	1.7	1.6	1.6	1.5	1.6
2.8	2.9	3.0	3.0	3.2	3.3	3.0	3.0	3.0	3.0	2.8	2.9	2.9	2.7	2.7	2.7	2.7	2.6	2.7	3.1	3.0	3.2	3.4	3.4	3.4	3.3	3.1	2.8	2.8	2.7	2.4	2.6	2.5	2.5	2.6	2.7
3.3	3.4	3.4	3.3	3.2	3.1	3.0	2.9	2.9	2.9	2.9	3.0	3.0	3.0	2.9	2.9	2.9	2.7	2.7	2.6	2.6	2.8	3.0	3.2	3.1	3.1	3.1	2.9	2.9	2.9	2.9	3.1	3.1	3.0	3.1	3.3
2.4	2.5	2.5	2.4	2.4	2.5	2.4	2.4	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.5	1.8	1.9	1.8	1.8	2.0	2.0	1.9	1.8	1.9	2.1	2.2	2.3
2.1	2.3	2.4	2.4	2.3	2.2	2.1	2.1	2.3	2.0	2.1	2.1	2.0	2.1	2.1	2.0	1.9	1.9	1.6	1.3	1.2	1.1	1.0	1.1	1.0	1.1	1.2	1.1	1.1	1.2	1.2	1.3	1.5	1.7	1.8	1.9

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

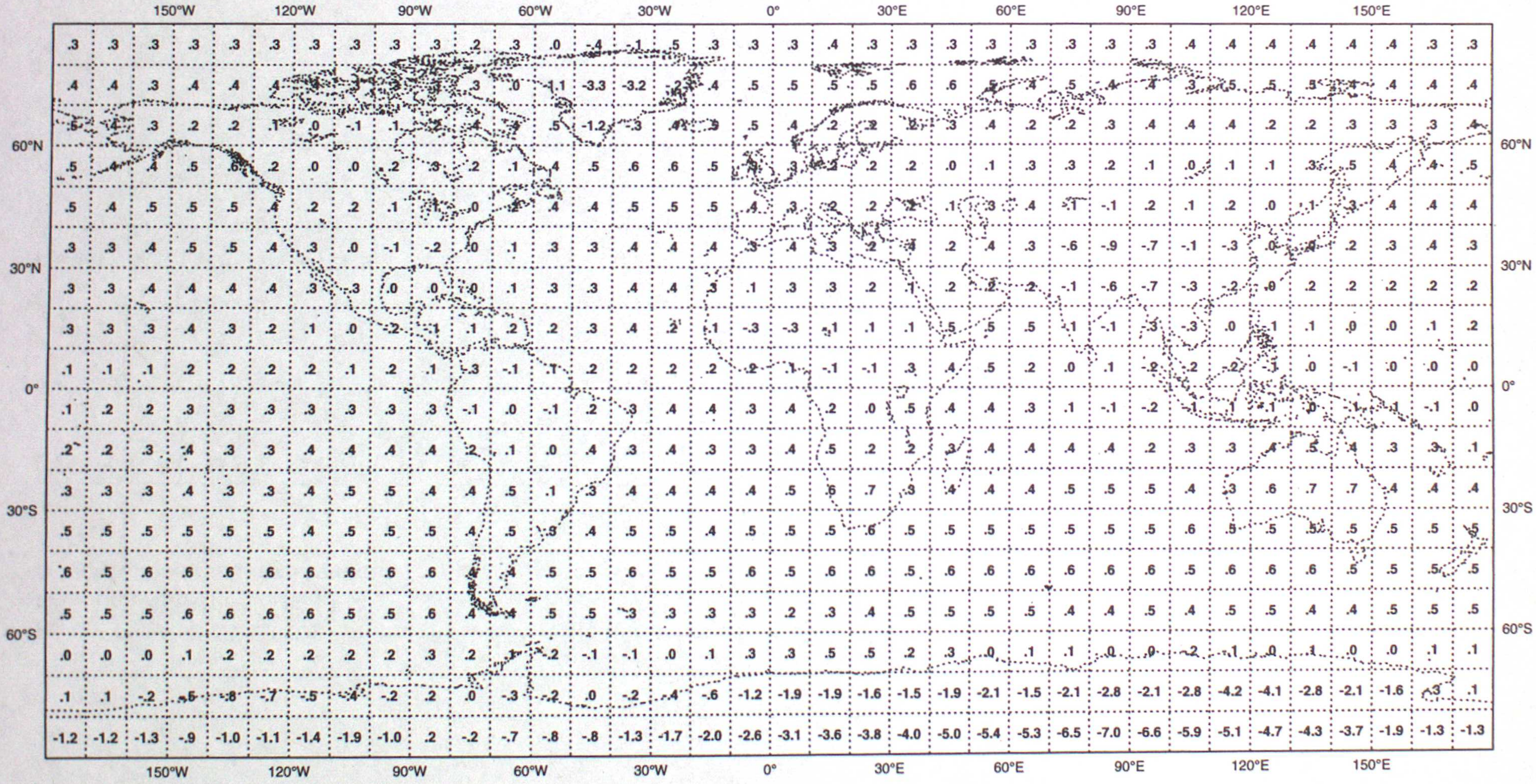

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

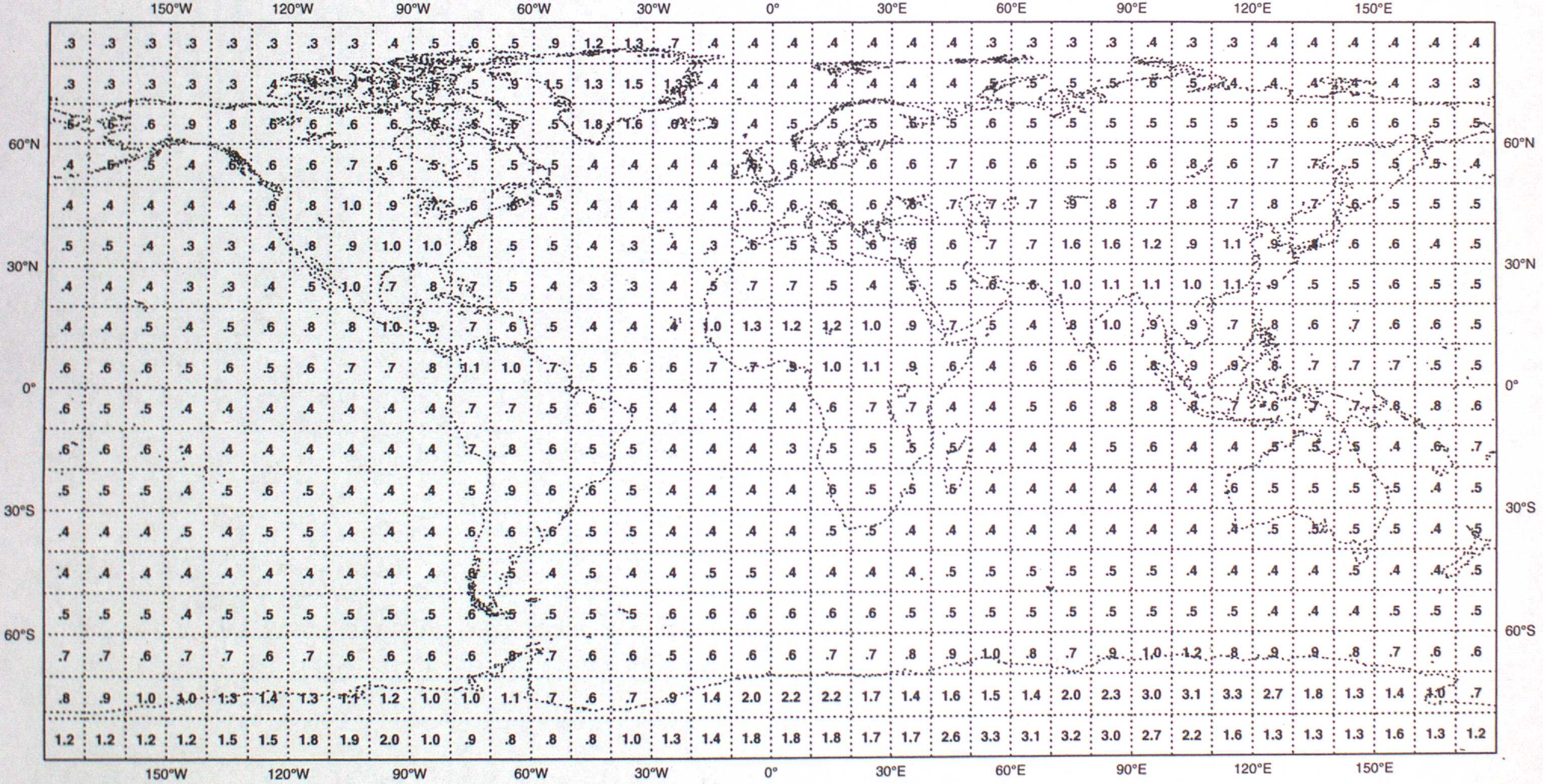

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .3 .3 .3 .3 .3 .3 .4 .5 .6 .5 .9 1.2 1.3 .7 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .3 .4 .4 .4 .4 .4 .4
.3 .3 .3 .3 .3 .4 .4 .4 .4 .5 .5 .9 1.5 1.3 1.5 1.3 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .6 .5 .4 .4 .4 .4 .4 .3 .3
.5 .6 .6 .9 .8 .6 .6 .6 .6 .6 .5 .5 .5 1.8 1.6 .6 .9 .4 .5 .5 .5 .6 .5 .6 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .5 .5
.4 .5 .5 .4 .6 .6 .6 .7 .6 .5 .5 .5 .5 .4 .4 .4 .4 .5 .6 .6 .6 .6 .7 .6 .6 .5 .5 .6 .8 .6 .7 .7 .5 .5 .5 .4
.4 .4 .4 .4 .4 .6 .8 1.0 .9 .7 .6 .6 .5 .4 .4 .4 .4 .6 .6 .6 .6 .8 .7 .7 .7 .9 .8 .7 .8 .7 .8 .7 .6 .5 .5 .5
.5 .5 .4 .3 .3 .4 .8 .9 1.0 1.0 .8 .5 .5 .4 .3 .4 .3 .6 .5 .5 .6 .6 .6 .7 .7 1.6 1.6 1.2 .9 1.1 .9 .4 .6 .6 .4 .5
.4 .4 .4 .3 .3 .4 .5 1.0 .7 .8 .7 .5 .4 .3 .3 .4 .5 .7 .7 .5 .4 .5 .5 .6 .6 1.0 1.1 1.1 1.0 1.1 .9 .5 .5 .6 .5 .5
.4 .4 .5 .4 .5 .6 .8 .8 1.0 .9 .7 .6 .5 .4 .4 .4 1.0 1.3 1.2 1.2 1.0 .9 .7 .5 .4 .8 1.0 .9 .9 .7 .8 .6 .7 .6 .6 .5
.6 .6 .6 .5 .6 .5 .6 .7 .7 .8 1.1 1.0 .7 .5 .6 .6 .7 .7 .9 1.0 1.1 .9 .6 .4 .6 .6 .6 .8 .9 .9 .8 .7 .7 .7 .5 .5
.6 .5 .5 .4 .4 .4 .4 .4 .4 .4 .7 .7 .5 .6 .5 .4 .4 .4 .4 .6 .7 .7 .4 .4 .5 .6 .8 .8 .8 .7 .6 .7 .7 .8 .8 .6
.6 .6 .6 .4 .4 .4 .4 .4 .4 .4 .7 .8 .6 .5 .5 .4 .4 .4 .3 .5 .5 .5 .5 .4 .4 .4 .5 .6 .4 .4 .5 .5 .5 .4 .6 .7
.5 .5 .5 .4 .5 .6 .5 .4 .4 .4 .5 .9 .6 .6 .5 .4 .4 .4 .4 .6 .5 .5 .5 .4 .4 .4 .4 .4 .4 .6 .5 .5 .5 .5 .4 .5
.4 .4 .4 .5 .4 .5 .5 .4 .4 .4 .6 .6 .6 .5 .5 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .5
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .6 .5 .4 .5 .4 .4 .5 .5 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .5 .4 .4 .5
.5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5
.7 .7 .6 .7 .7 .6 .7 .6 .6 .6 .6 .8 .7 .6 .6 .5 .6 .6 .6 .7 .7 .8 .9 1.0 .8 .7 .9 1.0 1.2 .8 .9 .9 .8 .7 .6 .6
.8 .9 1.0 1.0 1.3 1.4 1.3 1.1 1.2 1.0 1.0 1.1 .7 .6 .7 .9 1.4 2.0 2.2 2.2 1.7 1.4 1.6 1.5 1.4 2.0 2.3 3.0 3.1 3.3 2.7 1.8 1.3 1.4 1.0 .7
1.2 1.2 1.2 1.2 1.5 1.5 1.8 1.9 2.0 1.0 .9 .8 .8 .8 1.0 1.3 1.4 1.8 1.8 1.8 1.7 1.7 2.6 3.3 3.1 3.2 3.0 2.7 2.2 1.6 1.3 1.3 1.3 1.6 1.3 1.2

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

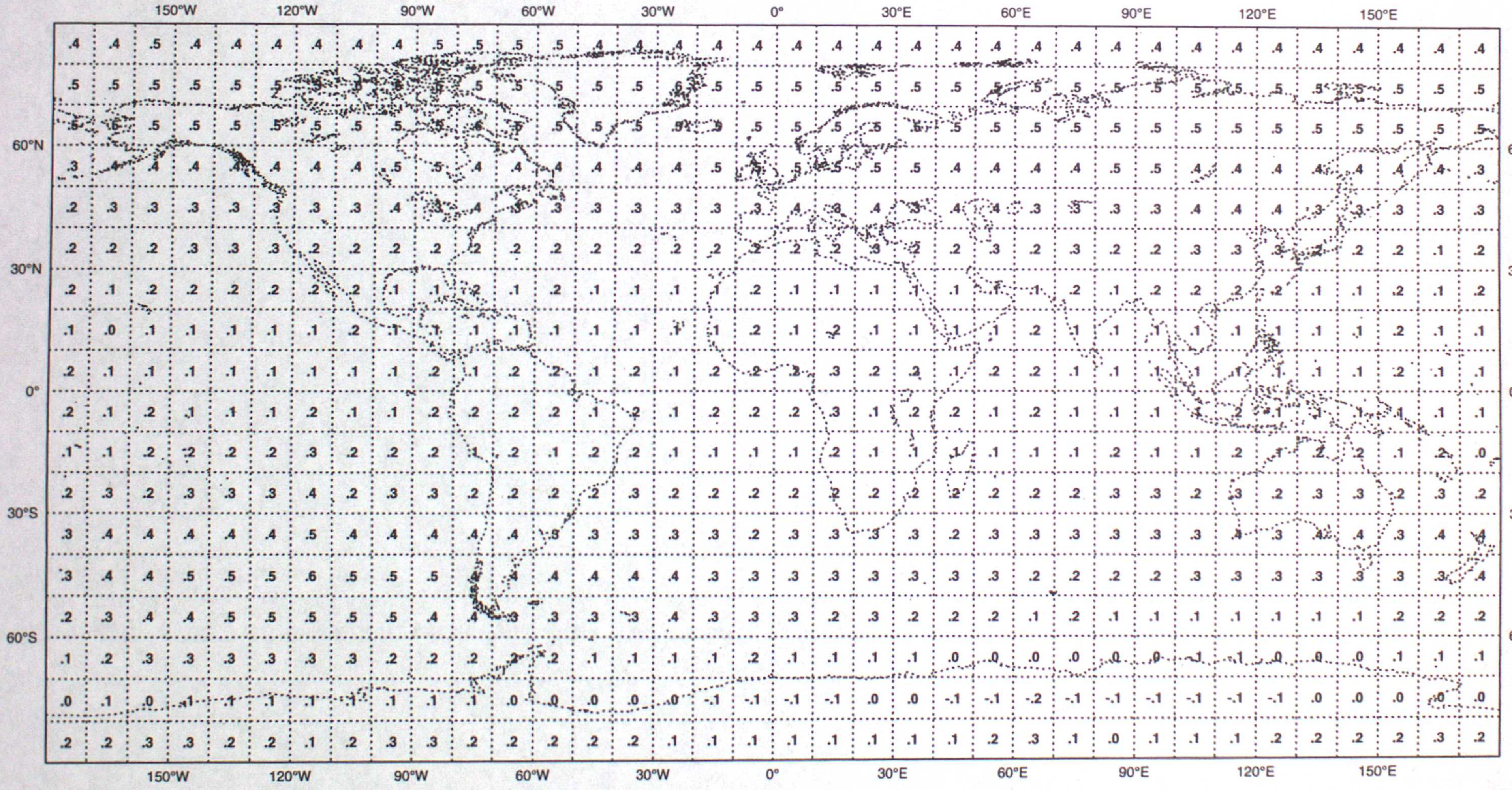

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

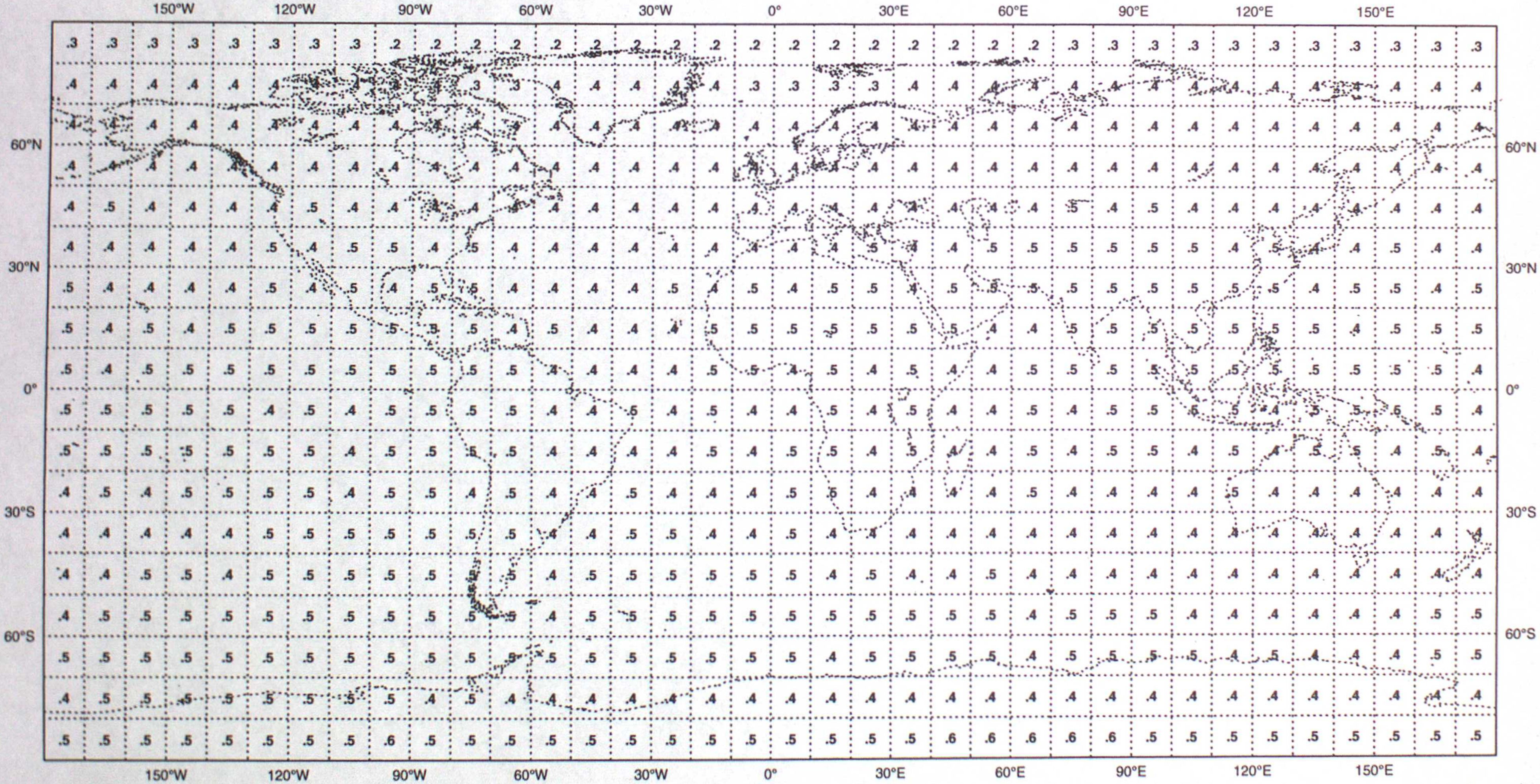
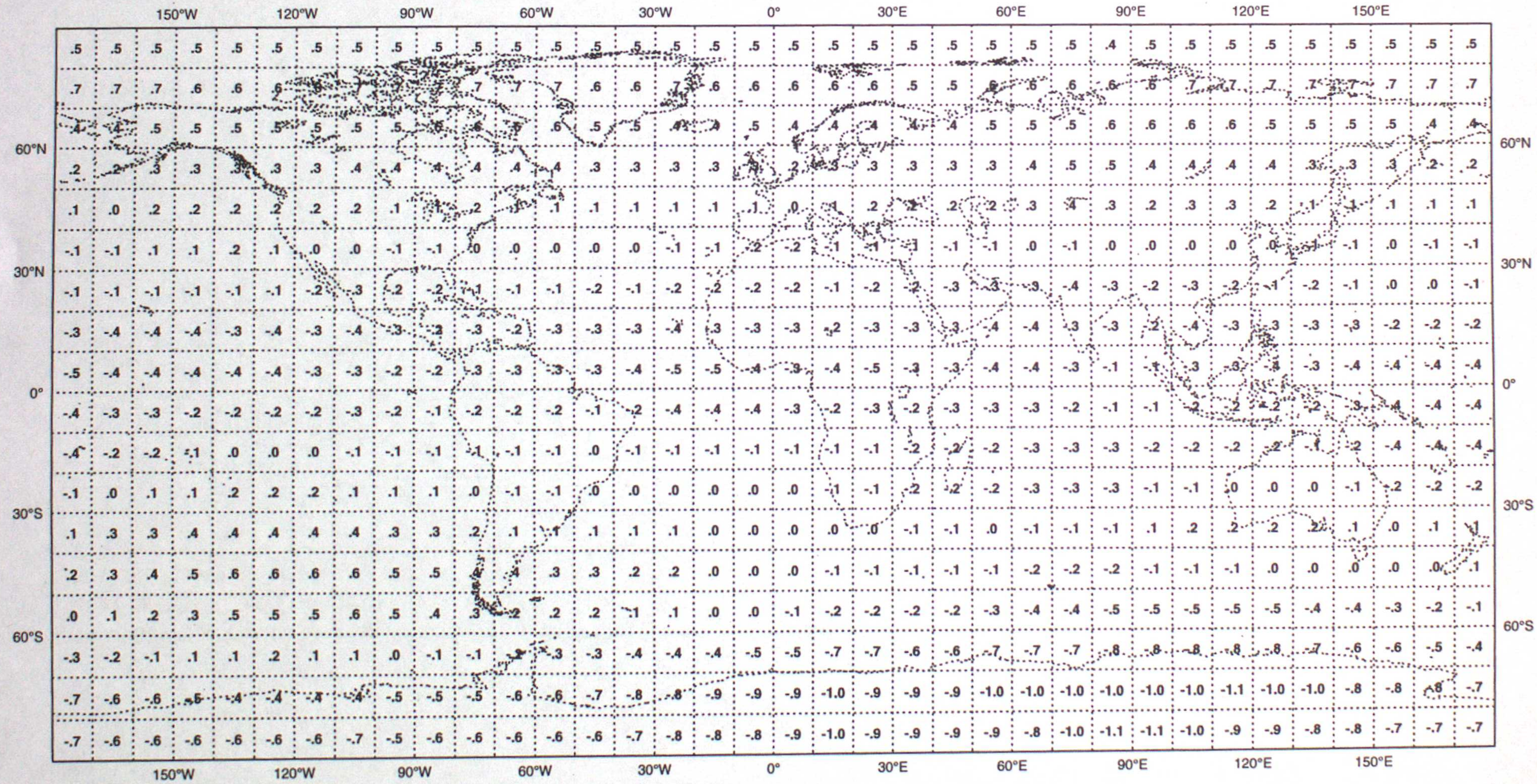

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .5 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .5 .4 .5 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .5 .5 .5 .5 .5 .5 .4 .5 .4 .4 .5 .4 .4
.5 .4 .4 .4 .4 .5 .4 .5 .4 .5 .5 .4 .4 .4 .4 .5 .4 .5 .4 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .4 .5
.5 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5
.5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .5 .5 .4 .5 .4 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4
.5 .5 .5 .5 .5 .4 .5 .4 .5 .5 .5 .5 .4 .4 .5 .4 .5 .4 .4 .5 .4 .5 .4 .4 .5 .4 .5 .5 .6 .5 .4 .5 .5 .6 .5 .4
.5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4 .4 .4 .4 .5 .4 .5 .5 .4 .5 .4 .4 .5 .4 .5 .5 .4 .5 .4 .5 .5 .4 .5 .4
.4 .5 .4 .5 .5 .5 .5 .4 .5 .5 .4 .5 .4 .4 .5 .4 .4 .4 .5 .5 .4 .4 .4 .4 .5 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .4 .5 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4 .5 .4 .4 .4 .5 .5
.4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations



.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5
.7	.7	.7	.6	.6	.6	.6	.7	.7	.7	.7	.7	.7	.6	.6	.7	.6	.6	.6	.6	.6	.5	.5	.6	.6	.6	.6	.6	.7	.7	.7	.7	.7	.7	.7	.7
.4	.4	.5	.5	.5	.5	.5	.5	.5	.6	.6	.5	.6	.5	.5	.4	.4	.5	.4	.4	.4	.4	.4	.5	.5	.5	.6	.6	.6	.6	.5	.5	.5	.5	.4	.4
.2	.2	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.4	.5	.5	.4	.4	.4	.4	.3	.3	.3	.2	.2
.1	.0	.2	.2	.2	.2	.2	.2	.1	.1	.2	.1	.1	.1	.1	.1	.1	.1	.0	.1	.2	.2	.2	.2	.3	.4	.3	.2	.3	.3	.2	.1	.1	.1	.1	.1
-.1	-.1	.1	.1	.2	.1	.0	.0	-.1	-.1	.0	.0	.0	.0	.0	-.1	-.1	-.2	-.2	-.1	-.1	-.1	-.1	-.1	.0	-.1	.0	.0	.0	.0	.0	-.1	-.1	.0	-.1	-.1
-.1	-.1	-.1	-.1	-.1	-.1	-.2	-.3	-.2	-.2	-.1	-.1	-.1	-.2	-.1	-.2	-.2	-.2	-.2	-.1	-.2	-.2	-.3	-.3	-.3	-.4	-.3	-.2	-.3	-.2	-.1	-.2	-.1	.0	.0	-.1
-.3	-.4	-.4	-.4	-.3	-.4	-.3	-.4	-.3	-.2	-.3	-.2	-.3	-.3	-.3	-.4	-.3	-.3	-.3	-.2	-.3	-.3	-.3	-.4	-.4	-.3	-.3	-.2	-.4	-.3	-.3	-.3	-.3	-.2	-.2	-.2
-.5	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.2	-.2	-.3	-.3	-.3	-.3	-.4	-.5	-.5	-.4	-.3	-.4	-.5	-.3	-.3	-.4	-.4	-.3	-.1	-.1	-.3	-.3	-.4	-.3	-.4	-.4	-.4	-.4
-.4	-.3	-.3	-.2	-.2	-.2	-.2	-.3	-.2	-.1	-.2	-.2	-.2	-.1	-.2	-.4	-.4	-.4	-.3	-.2	-.3	-.2	-.3	-.3	-.3	-.2	-.1	-.1	-.2	-.2	-.2	-.2	-.3	-.4	-.4	-.4
-.4	-.2	-.2	-.1	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.2	-.2	-.2	-.3	-.3	-.3	-.2	-.2	-.2	-.2	-.1	-.2	-.4	-.4	-.4
-.1	.0	.1	.1	.2	.2	.2	.1	.1	.1	.0	-.1	-.1	.0	.0	.0	.0	.0	.0	-.1	-.1	-.2	-.2	-.2	-.3	-.3	-.3	-.1	-.1	.0	.0	.0	-.1	-.2	-.2	-.2
.1	.3	.3	.4	.4	.4	.4	.4	.3	.3	.2	.1	.1	.1	.1	.1	.0	.0	.0	.0	.0	-.1	-.1	.0	-.1	-.1	-.1	.1	.2	.2	.2	.2	.1	.0	.1	.1
.2	.3	.4	.5	.6	.6	.6	.6	.5	.5	.4	.4	.3	.3	.2	.2	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.2	-.2	-.2	-.1	-.1	-.1	.0	.0	.0	.0	.0	.1
.0	.1	.2	.3	.5	.5	.5	.6	.5	.4	.3	.2	.2	.2	.1	.1	.0	.0	-.1	-.2	-.2	-.2	-.2	-.3	-.4	-.4	-.5	-.5	-.5	-.5	-.5	-.4	-.4	-.3	-.2	-.1
-.3	-.2	-.1	.1	.1	.2	.1	.1	.0	-.1	-.1	-.2	-.3	-.3	-.4	-.4	-.4	-.5	-.5	-.7	-.7	-.6	-.6	-.7	-.7	-.7	-.8	-.8	-.8	-.8	-.8	-.7	-.6	-.6	-.5	-.4
-.7	-.6	-.6	-.5	-.4	-.4	-.4	-.4	-.5	-.5	-.5	-.6	-.6	-.7	-.8	-.8	-.9	-.9	-.9	-1.0	-.9	-.9	-.9	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.1	-1.0	-1.0	-.8	-.8	-.8	-.7
-.7	-.6	-.6	-.6	-.6	-.6	-.6	-.7	-.5	-.6	-.6	-.6	-.6	-.6	-.7	-.8	-.8	-.8	-.9	-1.0	-.9	-.9	-.9	-.9	-.8	-1.0	-1.1	-1.1	-1.0	-.9	-.9	-.8	-.8	-.7	-.7	-.7

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

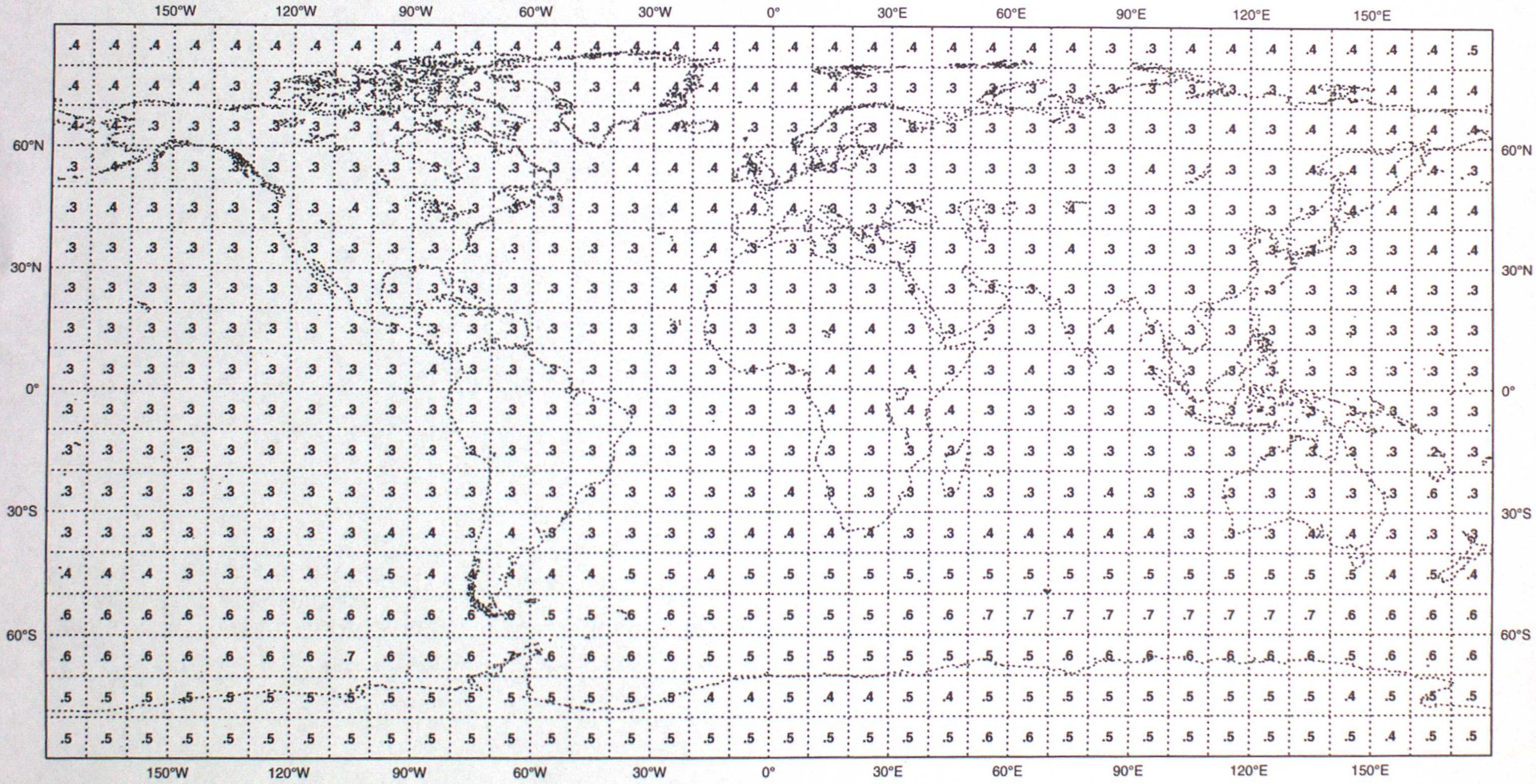
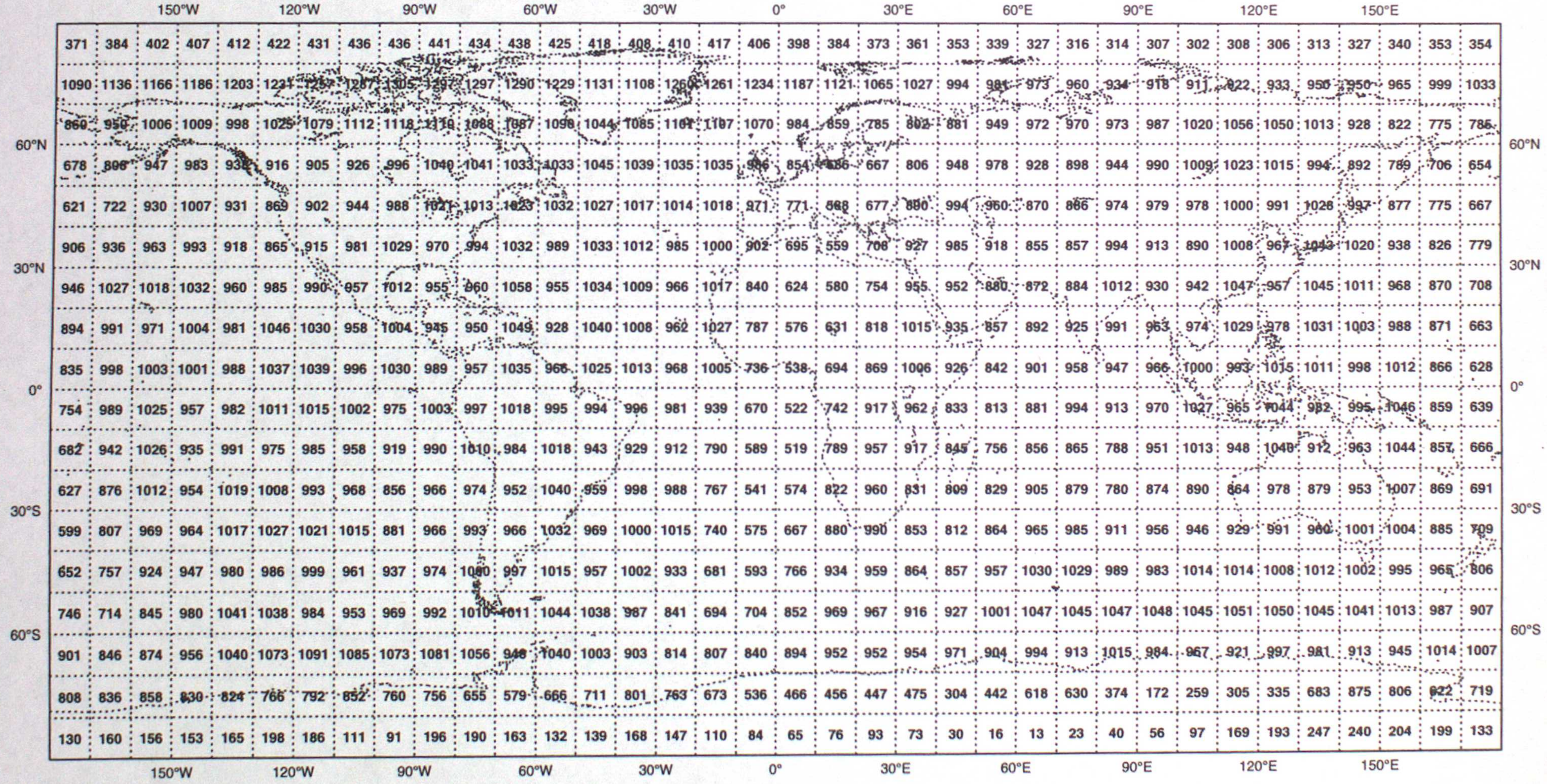

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 40. ATOVS mean daily count. JULY 2004
NOAA16, using all observations
Global average number of observations in 24 hours = 549824



371	384	402	407	412	422	431	436	436	441	434	438	425	418	408	410	417	406	398	384	373	361	353	339	327	316	314	307	302	308	306	313	327	340	353	354
1090	1136	1166	1186	1203	1231	1257	1287	1305	1297	1297	1290	1229	1131	1108	1260	1261	1234	1187	1121	1065	1027	994	981	973	960	934	918	911	822	933	950	950	965	999	1033
860	950	1006	1009	998	1025	1079	1112	1118	1110	1088	1087	1098	1044	1085	1101	1107	1070	984	859	785	802	881	949	972	970	973	987	1020	1056	1050	1013	928	822	775	785
678	896	947	983	932	916	905	926	996	1040	1041	1033	1033	1045	1039	1035	1035	996	854	836	667	806	948	978	928	898	944	990	1009	1023	1015	994	892	789	706	654
621	722	930	1007	931	869	902	944	988	1021	1013	1023	1032	1027	1017	1014	1018	971	771	868	677	890	994	960	870	866	974	979	978	1000	991	1028	997	877	775	667
906	936	963	993	918	865	915	981	1029	970	994	1032	989	1033	1012	985	1000	902	695	559	708	927	985	918	855	857	994	913	890	1008	967	1043	1020	938	826	779
946	1027	1018	1032	960	985	990	957	1012	955	960	1058	955	1034	1009	966	1017	840	624	580	754	955	952	880	872	884	1012	930	942	1047	957	1045	1011	968	870	708
894	991	971	1004	981	1046	1030	958	1004	945	950	1049	928	1040	1008	962	1027	787	576	631	818	1015	935	857	892	925	991	963	974	1029	978	1031	1003	988	871	663
835	998	1003	1001	988	1037	1039	996	1030	989	957	1035	966	1025	1013	968	1005	736	538	694	869	1006	926	842	901	958	947	966	1000	993	1015	1011	998	1012	866	628
754	989	1025	957	982	1011	1015	1002	975	1003	997	1018	995	994	996	981	939	670	522	742	917	962	833	813	881	994	913	970	1027	965	1044	982	995	1046	859	639
682	942	1026	935	991	975	985	958	919	990	1010	984	1018	943	929	912	790	589	519	789	957	917	845	756	856	865	788	951	1013	948	1040	912	963	1044	857	666
627	876	1012	954	1019	1008	993	968	856	966	974	952	1040	959	998	988	767	541	574	822	960	831	809	829	905	879	780	874	890	864	978	879	953	1007	869	691
599	807	969	964	1017	1027	1021	1015	881	966	993	966	1032	969	1000	1015	740	575	667	880	990	853	812	864	965	985	911	956	946	929	991	960	1001	1004	885	709
652	757	924	947	980	986	999	961	937	974	1080	997	1015	957	1002	933	681	593	766	934	959	864	857	957	1030	1029	989	983	1014	1014	1008	1012	1002	995	965	806
746	714	845	980	1041	1038	984	953	969	992	1010	1011	1044	1038	987	841	694	704	852	969	967	916	927	1001	1047	1045	1047	1048	1045	1051	1050	1045	1041	1013	987	907
901	846	874	956	1040	1073	1091	1085	1073	1081	1056	948	1040	1003	903	814	807	840	894	952	952	954	971	904	994	913	1015	984	967	921	997	981	913	945	1014	1007
808	836	858	830	824	766	792	852	760	756	655	579	666	711	801	763	673	536	466	456	447	475	304	442	618	630	374	172	259	305	335	683	875	806	822	719
130	160	156	153	165	198	186	111	91	196	190	163	132	139	168	147	110	84	65	76	93	73	30	16	13	23	40	56	97	169	193	247	240	204	199	133

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations

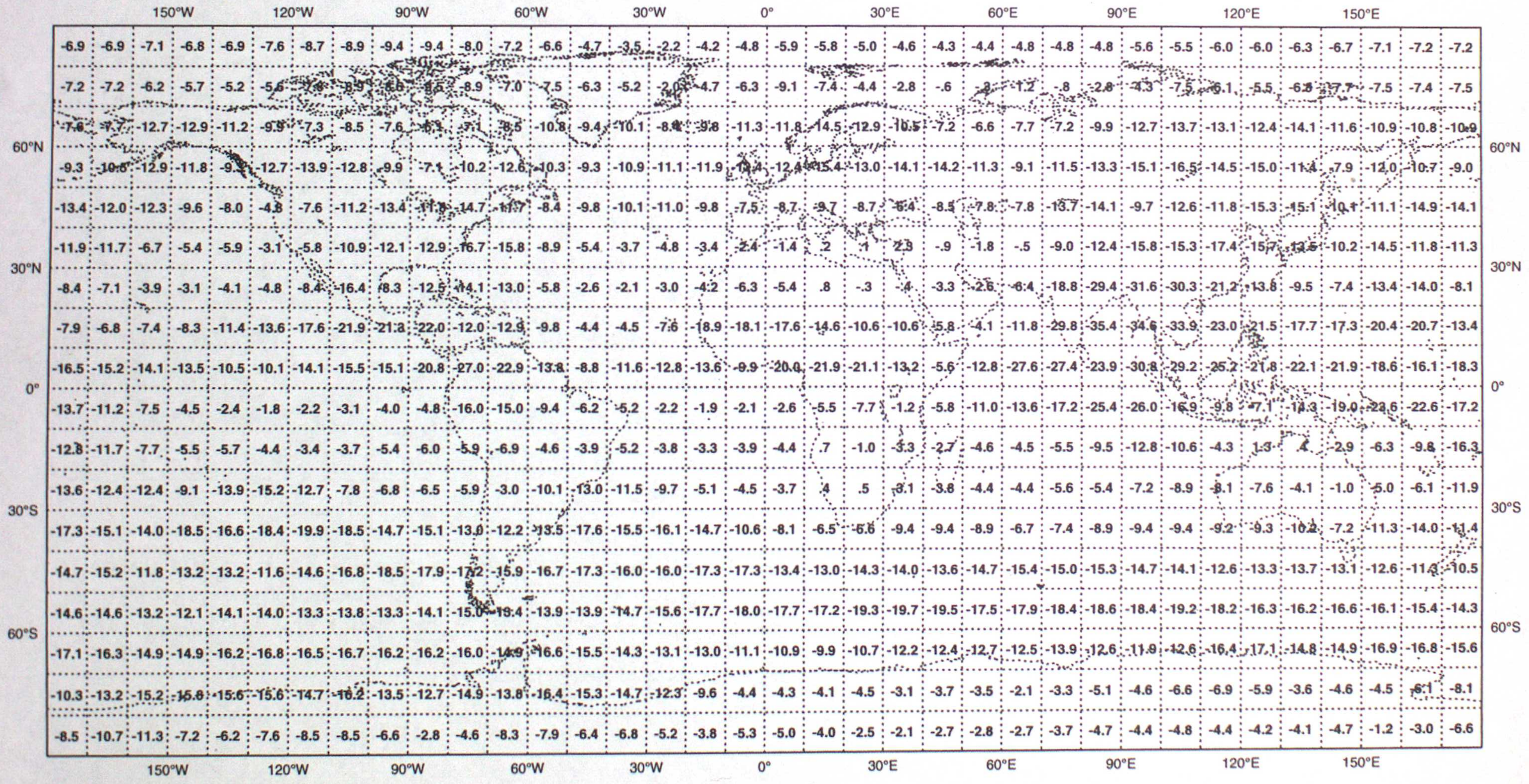
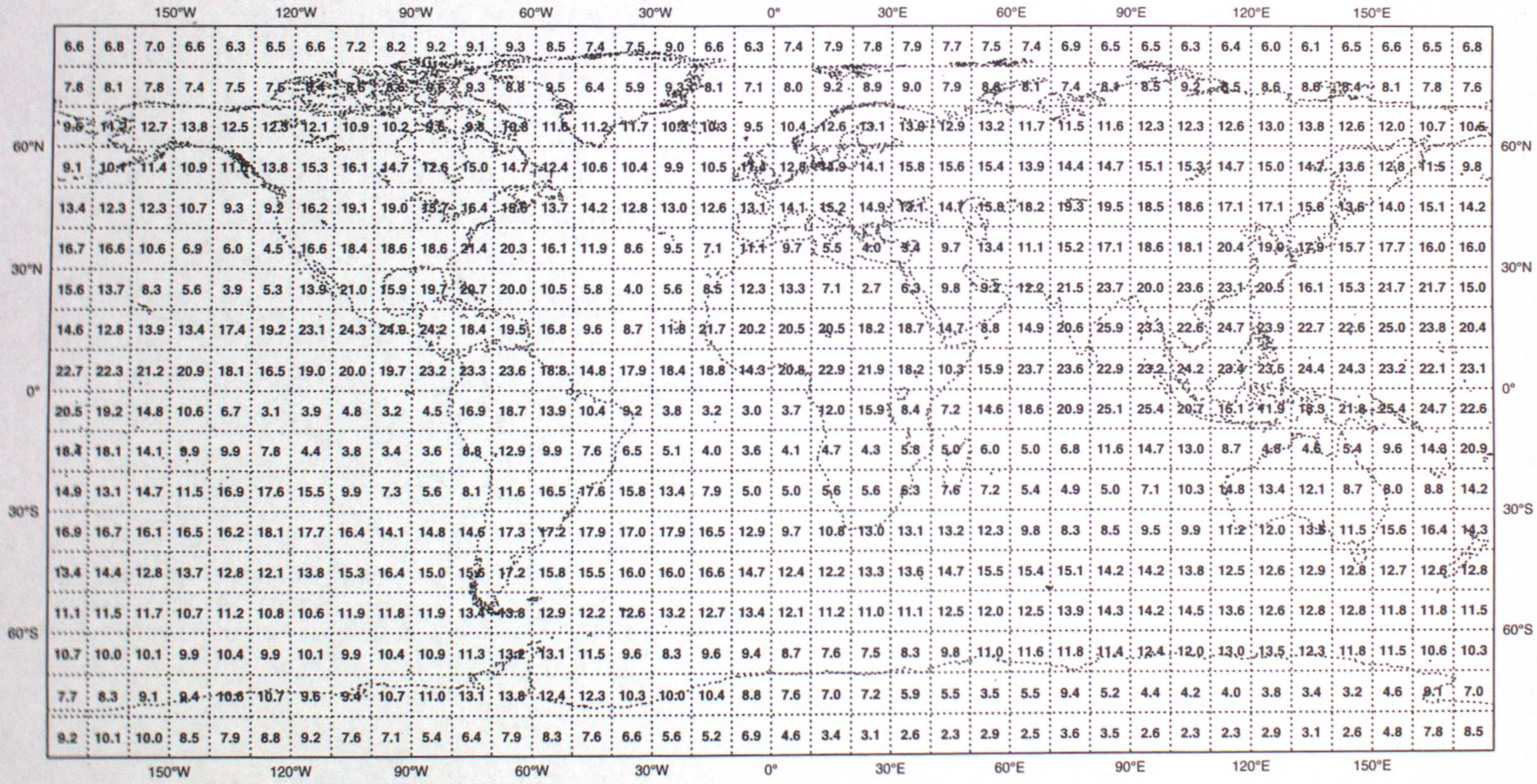
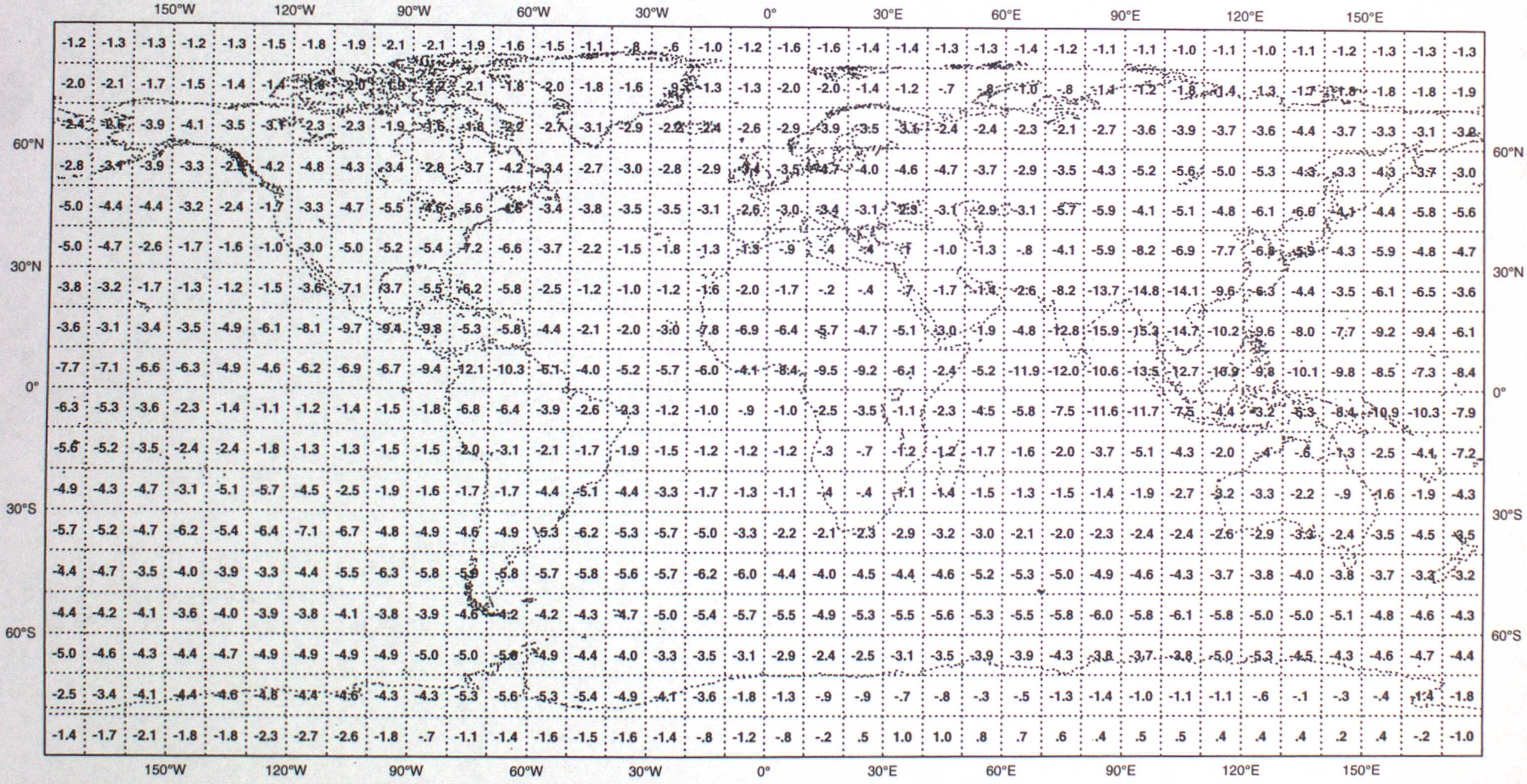

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-6.9 -6.9 -7.1 -6.8 -6.9 -7.6 -8.7 -8.9 -9.4 -9.4 -8.0 -7.2 -6.6 -4.7 -3.5 -2.2 -4.2 -4.8 -5.9 -5.8 -5.0 -4.6 -4.3 -4.4 -4.8 -4.8 -4.8 -5.6 -5.5 -6.0 -6.0 -6.3 -6.7 -7.1 -7.2 -7.2
-7.2 -7.2 -6.2 -5.7 -5.2 -5.6 -7.8 -8.9 -8.6 -8.5 -8.9 -7.0 -7.5 -6.3 -5.2 -2.0 -4.7 -6.3 -9.1 -7.4 -4.4 -2.8 -.6 -.3 -1.2 -.8 -2.8 -4.3 -7.5 -6.1 -5.5 -6.8 -7.7 -7.5 -7.4 -7.5
-7.6 -7.7 -12.7 -12.9 -11.2 -9.9 -7.3 -8.5 -7.6 -8.1 -7.1 -8.5 -10.8 -9.4 -10.1 -8.4 -9.8 -11.3 -11.8 -14.5 -12.9 -10.5 -7.2 -6.6 -7.7 -7.2 -9.9 -12.7 -13.7 -13.1 -12.4 -14.1 -11.6 -10.9 -10.8 -10.9
-9.3 -10.6 -12.9 -11.8 -9.2 -12.7 -13.9 -12.8 -9.9 -7.1 -10.2 -12.6 -10.3 -9.3 -10.9 -11.1 -11.9 -13.4 -12.4 -15.4 -13.0 -14.1 -14.2 -11.3 -9.1 -11.5 -13.3 -15.1 -16.5 -14.5 -15.0 -11.4 -7.9 -12.0 -10.7 -9.0
-13.4 -12.0 -12.3 -9.6 -8.0 -4.8 -7.6 -11.2 -13.4 -11.8 -14.7 -11.7 -8.4 -9.8 -10.1 -11.0 -9.8 -7.5 -8.7 -9.7 -8.7 -6.4 -8.5 -7.8 -7.8 -13.7 -14.1 -9.7 -12.6 -11.8 -15.3 -15.1 -10.1 -11.1 -14.9 -14.1
-11.9 -11.7 -6.7 -5.4 -5.9 -3.1 -5.8 -10.9 -12.1 -12.9 -16.7 -15.8 -8.9 -5.4 -3.7 -4.8 -3.4 -2.4 -1.4 .2 .1 2.3 -.9 -1.8 -.5 -9.0 -12.4 -15.8 -15.3 -17.4 -15.7 -13.5 -10.2 -14.5 -11.8 -11.3
-8.4 -7.1 -3.9 -3.1 -4.1 -4.8 -8.4 -16.4 -8.3 -12.5 -14.1 -13.0 -5.8 -2.6 -2.1 -3.0 -4.2 -6.3 -5.4 .8 -.3 -.4 -3.3 -2.6 -6.4 -18.8 -29.4 -31.6 -30.3 -21.2 -13.8 -9.5 -7.4 -13.4 -14.0 -8.1
-7.9 -6.8 -7.4 -8.3 -11.4 -13.6 -17.6 -21.9 -21.8 -22.0 -12.0 -12.9 -9.8 -4.4 -4.5 -7.6 -18.9 -18.1 -17.6 -14.6 -10.6 -10.6 -5.8 -4.1 -11.8 -29.8 -35.4 -34.6 -33.9 -23.0 -21.5 -17.7 -17.3 -20.4 -20.7 -13.4
-16.5 -15.2 -14.1 -13.5 -10.5 -10.1 -14.1 -15.5 -15.1 -20.8 -27.0 -22.9 -13.8 -8.8 -11.6 -12.8 -13.6 -9.9 -20.0 -21.9 -21.1 -13.2 -5.6 -12.8 -27.6 -27.4 -23.9 -30.8 -29.2 -25.2 -21.8 -22.1 -21.9 -18.6 -16.1 -18.3
-13.7 -11.2 -7.5 -4.5 -2.4 -1.8 -2.2 -3.1 -4.0 -4.8 -16.0 -15.0 -9.4 -6.2 -5.2 -2.2 -1.9 -2.1 -2.6 -5.5 -7.7 -1.2 -5.8 -11.0 -13.6 -17.2 -25.4 -26.0 -16.9 -9.8 -7.1 -14.3 -19.0 -23.6 -22.6 -17.2
-12.8 -11.7 -7.7 -5.5 -5.7 -4.4 -3.4 -3.7 -5.4 -6.0 -5.9 -6.9 -4.6 -3.9 -5.2 -3.8 -3.3 -3.9 -4.4 .7 -1.0 -3.3 -2.7 -4.6 -4.5 -5.5 -9.5 -12.8 -10.6 -4.3 1.3 .4 -2.9 -6.3 -9.8 -16.3
-13.6 -12.4 -12.4 -9.1 -13.9 -15.2 -12.7 -7.8 -6.8 -6.5 -5.9 -3.0 -10.1 -13.0 -11.5 -9.7 -5.1 -4.5 -3.7 .4 .5 -3.1 -3.8 -4.4 -4.4 -5.6 -5.4 -7.2 -8.9 -8.1 -7.6 -4.1 -1.0 -5.0 -6.1 -11.9
-17.3 -15.1 -14.0 -18.5 -16.6 -18.4 -19.9 -18.5 -14.7 -15.1 -13.0 -12.2 -13.5 -17.6 -15.5 -16.1 -14.7 -10.6 -8.1 -6.5 -6.6 -9.4 -9.4 -8.9 -6.7 -7.4 -8.9 -9.4 -9.4 -9.2 -9.3 -10.2 -7.2 -11.3 -14.0 -11.4
-14.7 -15.2 -11.8 -13.2 -13.2 -11.6 -14.6 -16.8 -18.5 -17.9 -17.2 -15.9 -16.7 -17.3 -16.0 -16.0 -17.3 -17.3 -13.4 -13.0 -14.3 -14.0 -13.6 -14.7 -15.4 -15.0 -15.3 -14.7 -14.1 -12.6 -13.3 -13.7 -13.1 -12.6 -11.3 -10.5
-14.6 -14.6 -13.2 -12.1 -14.1 -14.0 -13.3 -13.8 -13.3 -14.1 -15.0 -18.4 -13.9 -13.9 -14.7 -15.6 -17.7 -18.0 -17.7 -17.2 -19.3 -19.7 -19.5 -17.5 -17.9 -18.4 -18.6 -18.4 -19.2 -18.2 -16.3 -16.2 -16.6 -16.1 -15.4 -14.3
-17.1 -16.3 -14.9 -14.9 -16.2 -16.8 -16.5 -16.7 -16.2 -16.2 -16.0 -14.9 -16.6 -15.5 -14.3 -13.1 -13.0 -11.1 -10.9 -9.9 -10.7 -12.2 -12.4 -12.7 -12.5 -13.9 -12.6 -11.9 -12.6 -16.4 -17.1 -14.8 -14.9 -16.9 -16.8 -15.6
-10.3 -13.2 -15.2 -15.8 -15.6 -15.6 -14.7 -16.2 -13.5 -12.7 -14.9 -13.8 -16.4 -15.3 -14.7 -12.3 -9.6 -4.4 -4.3 -4.1 -4.5 -3.1 -3.7 -3.5 -2.1 -3.3 -5.1 -4.6 -6.6 -6.9 -5.9 -3.6 -4.6 -4.5 -6.1 -8.1
-8.5 -10.7 -11.3 -7.2 -6.2 -7.6 -8.5 -8.5 -6.6 -2.8 -4.6 -8.3 -7.9 -6.4 -6.8 -5.2 -3.8 -5.3 -5.0 -4.0 -2.5 -2.1 -2.7 -2.8 -2.7 -3.7 -4.7 -4.4 -4.8 -4.4 -4.2 -4.1 -4.7 -1.2 -3.0 -6.6

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations



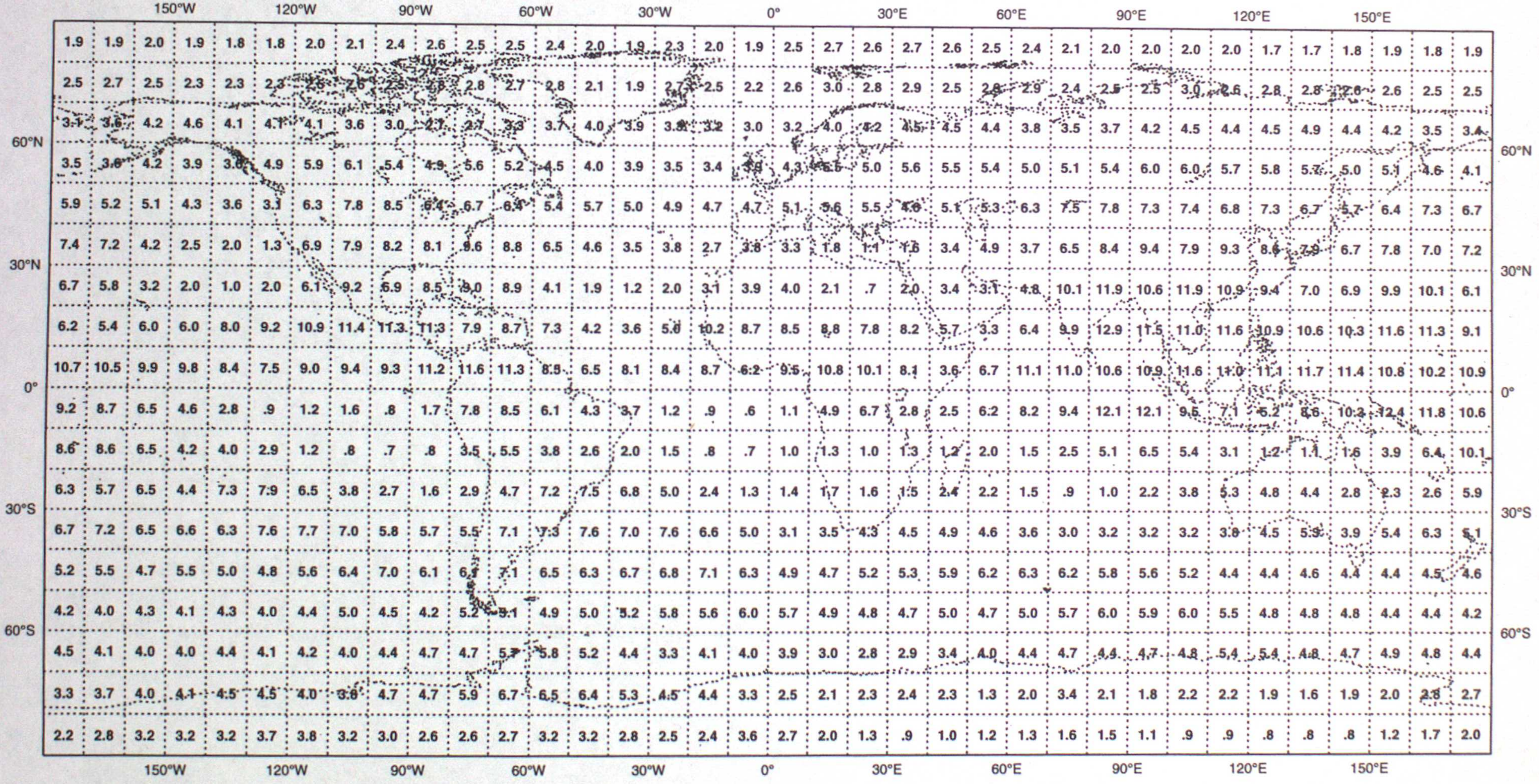
6.6	6.8	7.0	6.6	6.3	6.5	6.6	7.2	8.2	9.2	9.1	9.3	8.5	7.4	7.5	9.0	6.6	6.3	7.4	7.9	7.8	7.9	7.7	7.5	7.4	6.9	6.5	6.5	6.3	6.4	6.0	6.1	6.5	6.6	6.5	6.8
7.8	8.1	7.8	7.4	7.5	7.5	8.4	8.6	8.6	8.6	9.3	8.8	9.5	6.4	5.9	9.3	8.1	7.1	8.0	9.2	8.9	9.0	7.9	8.6	8.1	7.4	8.4	8.5	9.2	8.5	8.6	8.6	8.4	8.1	7.8	7.6
9.6	14.2	12.7	13.8	12.5	12.3	12.1	10.9	10.2	9.6	9.8	10.8	11.6	11.2	11.7	10.3	10.3	9.5	10.4	12.6	13.1	13.9	12.9	13.2	11.7	11.5	11.6	12.3	12.3	12.6	13.0	13.8	12.6	12.0	10.7	10.6
9.1	10.4	11.4	10.9	11.6	13.8	15.3	16.1	14.7	12.6	15.0	14.7	12.4	10.6	10.4	9.9	10.5	11.4	12.8	14.9	14.1	15.8	15.6	15.4	13.9	14.4	14.7	15.1	15.3	14.7	15.0	14.7	13.6	12.8	11.5	9.8
13.4	12.3	12.3	10.7	9.3	9.2	16.2	19.1	19.0	15.7	16.4	18.6	13.7	14.2	12.8	13.0	12.6	13.1	14.1	15.2	14.9	13.1	14.1	15.8	18.2	19.3	19.5	18.5	18.6	17.1	17.1	15.6	13.6	14.0	15.1	14.2
16.7	16.6	10.6	6.9	6.0	4.5	16.6	18.4	18.6	18.6	21.4	20.3	16.1	11.9	8.6	9.5	7.1	11.1	9.7	5.5	4.0	3.4	9.7	13.4	11.1	15.2	17.1	18.6	18.1	20.4	19.0	17.9	15.7	17.7	16.0	16.0
15.6	13.7	8.3	5.6	3.9	5.3	13.9	21.0	15.9	19.7	20.7	20.0	10.5	5.8	4.0	5.6	8.5	12.3	13.3	7.1	2.7	6.3	9.8	9.2	12.2	21.5	23.7	20.0	23.6	23.1	20.5	16.1	15.3	21.7	21.7	15.0
14.6	12.8	13.9	13.4	17.4	19.2	23.1	24.3	24.8	24.2	18.4	19.5	16.8	9.6	8.7	11.8	21.7	20.2	20.5	20.5	18.2	18.7	14.7	8.8	14.9	20.6	25.9	23.3	22.6	24.7	23.9	22.7	22.6	25.0	23.8	20.4
22.7	22.3	21.2	20.9	18.1	16.5	19.0	20.0	19.7	23.2	23.3	23.6	18.8	14.8	17.9	18.4	18.8	14.3	20.8	22.9	21.9	18.2	10.3	15.9	23.7	23.6	22.9	23.2	24.2	23.4	23.5	24.4	24.3	23.2	22.1	23.1
20.5	19.2	14.8	10.6	6.7	3.1	3.9	4.8	3.2	4.5	16.9	18.7	13.9	10.4	9.2	3.8	3.2	3.0	3.7	12.0	15.9	8.4	7.2	14.6	18.6	20.9	25.1	25.4	20.7	16.1	11.9	18.9	21.8	25.4	24.7	22.6
18.4	18.1	14.1	9.9	9.9	7.8	4.4	3.8	3.4	3.6	8.8	12.9	9.9	7.6	6.5	5.1	4.0	3.6	4.1	4.7	4.3	5.8	5.0	6.0	5.0	6.8	11.6	14.7	13.0	8.7	4.8	4.6	5.4	9.6	14.8	20.9
14.9	13.1	14.7	11.5	16.9	17.6	15.5	9.9	7.3	5.6	8.1	11.6	16.5	17.6	15.8	13.4	7.9	5.0	5.0	5.6	5.6	6.3	7.6	7.2	5.4	4.9	5.0	7.1	10.3	14.8	13.4	12.1	8.7	8.0	8.8	14.2
16.9	16.7	16.1	16.5	16.2	18.1	17.7	16.4	14.1	14.8	14.6	17.3	17.2	17.9	17.0	17.9	16.5	12.9	9.7	10.8	13.0	13.1	13.2	12.3	9.8	8.3	8.5	9.5	9.9	11.2	12.0	13.5	11.5	15.6	16.4	14.3
13.4	14.4	12.8	13.7	12.8	12.1	13.8	15.3	16.4	15.0	15.6	17.2	15.8	15.5	16.0	16.0	16.6	14.7	12.4	12.2	13.3	13.6	14.7	15.5	15.4	15.1	14.2	14.2	13.8	12.5	12.6	12.9	12.8	12.7	12.6	12.8
11.1	11.5	11.7	10.7	11.2	10.8	10.6	11.9	11.8	11.9	13.4	13.8	12.9	12.2	12.6	13.2	12.7	13.4	12.1	11.2	11.0	11.1	12.5	12.0	12.5	13.9	14.3	14.2	14.5	13.6	12.6	12.8	12.8	11.8	11.8	11.5
10.7	10.0	10.1	9.9	10.4	9.9	10.1	9.9	10.4	10.9	11.3	13.2	13.1	11.5	9.6	8.3	9.6	9.4	8.7	7.6	7.5	8.3	9.8	11.0	11.6	11.8	11.4	12.4	12.0	13.0	13.5	12.3	11.8	11.5	10.6	10.3
7.7	8.3	9.1	9.4	10.6	10.7	9.6	9.4	10.7	11.0	13.1	13.8	12.4	12.3	10.3	10.0	10.4	8.8	7.6	7.0	7.2	5.9	5.5	3.5	5.5	9.4	5.2	4.4	4.2	4.0	3.8	3.4	3.2	4.6	9.1	7.0
9.2	10.1	10.0	8.5	7.9	8.8	9.2	7.6	7.1	5.4	6.4	7.9	8.3	7.6	6.6	5.6	5.2	6.9	4.6	3.4	3.1	2.6	2.3	2.9	2.5	3.6	3.5	2.6	2.3	2.3	2.9	3.1	2.6	4.8	7.8	8.5

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



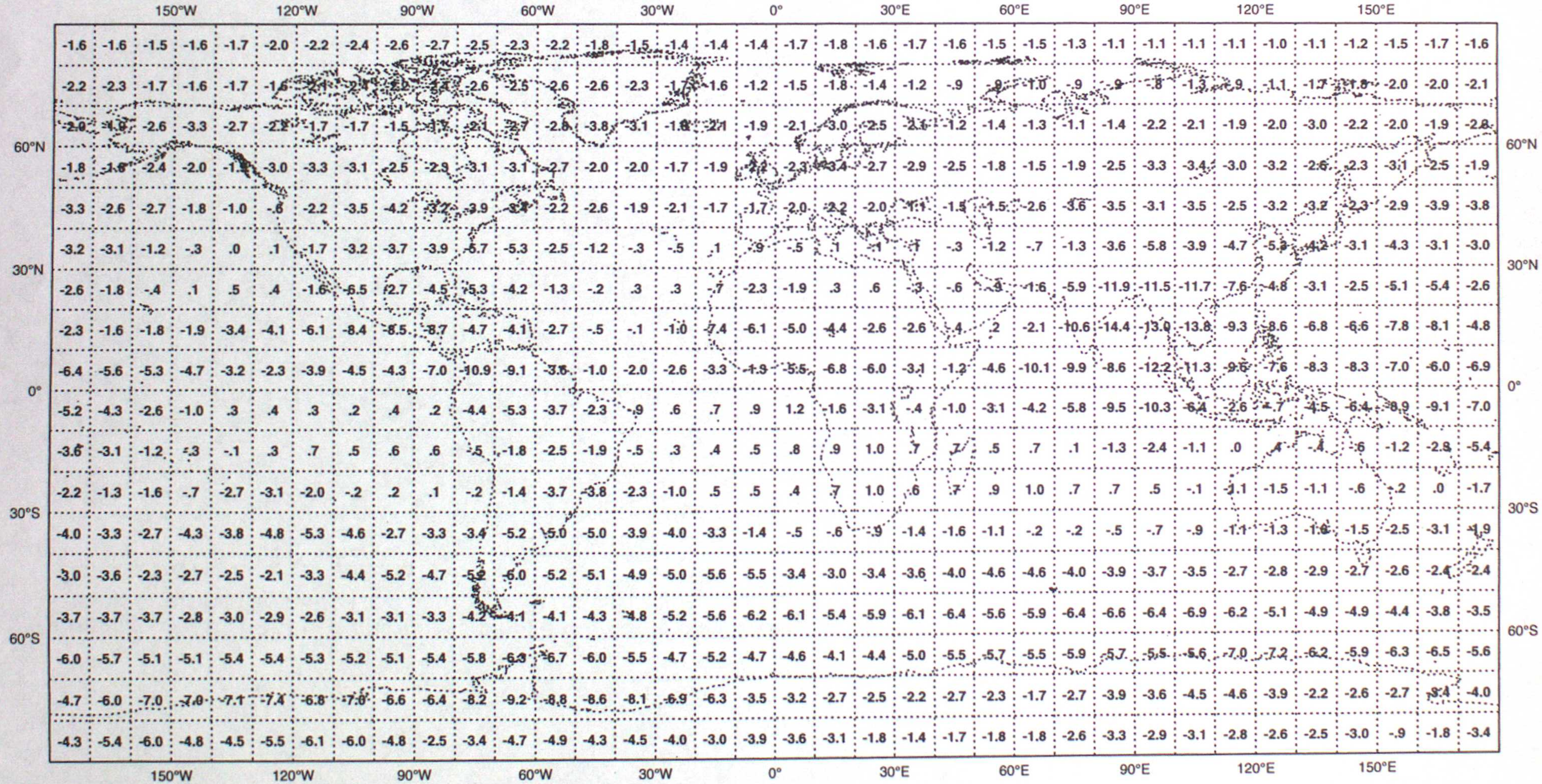
-1.2	-1.3	-1.3	-1.2	-1.3	-1.5	-1.8	-1.9	-2.1	-2.1	-1.9	-1.6	-1.5	-1.1	-.8	-.6	-1.0	-1.2	-1.6	-1.6	-1.4	-1.4	-1.3	-1.3	-1.4	-1.2	-1.1	-1.1	-1.0	-1.1	-1.0	-1.1	-1.2	-1.3	-1.3	-1.3
-2.0	-2.1	-1.7	-1.5	-1.4	-1.4	-1.6	-2.0	-1.9	-2.2	-2.1	-1.8	-2.0	-1.8	-1.6	-.9	-1.3	-1.3	-2.0	-2.0	-1.4	-1.2	-.7	-.8	-1.0	-.8	-1.4	-1.2	-1.8	-1.4	-1.3	-1.7	-1.8	-1.8	-1.8	-1.9
-2.4	-2.6	-3.9	-4.1	-3.5	-3.1	-2.3	-2.3	-1.9	-1.6	-1.8	-2.2	-2.7	-3.1	-2.9	-2.2	-2.4	-2.6	-2.9	-3.9	-3.5	-3.1	-2.4	-2.4	-2.3	-2.1	-2.7	-3.6	-3.9	-3.7	-3.6	-4.4	-3.7	-3.3	-3.1	-3.2
-2.8	-3.4	-3.9	-3.3	-2.8	-4.2	-4.8	-4.3	-3.4	-2.8	-3.7	-4.2	-3.4	-2.7	-3.0	-2.8	-2.9	-3.4	-3.5	-4.7	-4.0	-4.6	-4.7	-3.7	-2.9	-3.5	-4.3	-5.2	-5.6	-5.0	-5.3	-4.3	-3.3	-4.3	-3.7	-3.0
-5.0	-4.4	-4.4	-3.2	-2.4	-1.7	-3.3	-4.7	-5.5	-4.6	-5.6	-4.6	-3.4	-3.8	-3.5	-3.5	-3.1	-2.6	-3.0	-3.4	-3.1	-2.3	-3.1	-2.9	-3.1	-5.7	-5.9	-4.1	-5.1	-4.8	-6.1	-6.0	-4.1	-4.4	-5.8	-5.6
-5.0	-4.7	-2.6	-1.7	-1.6	-1.0	-3.0	-5.0	-5.2	-5.4	-7.2	-6.6	-3.7	-2.2	-1.5	-1.8	-1.3	-1.3	-.9	-.4	-.4	-.1	-1.0	-1.3	-.8	-4.1	-5.9	-8.2	-6.9	-7.7	-6.8	-5.9	-4.3	-5.9	-4.8	-4.7
-3.8	-3.2	-1.7	-1.3	-1.2	-1.5	-3.6	-7.1	-3.7	-5.5	-6.2	-5.8	-2.5	-1.2	-1.0	-1.2	-1.6	-2.0	-1.7	-.2	-.4	-.7	-1.7	-1.4	-2.6	-8.2	-13.7	-14.8	-14.1	-9.6	-6.3	-4.4	-3.5	-6.1	-6.5	-3.6
-3.6	-3.1	-3.4	-3.5	-4.9	-6.1	-8.1	-9.7	-9.4	-9.8	-5.3	-5.8	-4.4	-2.1	-2.0	-3.0	-7.8	-6.9	-6.4	-5.7	-4.7	-5.1	-3.0	-1.9	-4.8	-12.8	-15.9	-15.3	-14.7	-10.2	-9.6	-8.0	-7.7	-9.2	-9.4	-6.1
-7.7	-7.1	-6.6	-6.3	-4.9	-4.6	-6.2	-6.9	-6.7	-9.4	-12.1	-10.3	-5.1	-4.0	-5.2	-5.7	-6.0	-4.1	-8.4	-9.5	-9.2	-6.1	-2.4	-5.2	-11.9	-12.0	-10.6	-13.5	-12.7	-10.9	-9.8	-10.1	-9.8	-8.5	-7.3	-8.4
-6.3	-5.3	-3.6	-2.3	-1.4	-1.1	-1.2	-1.4	-1.5	-1.8	-6.8	-6.4	-3.9	-2.6	-2.3	-1.2	-1.0	-.9	-1.0	-2.5	-3.5	-1.1	-2.3	-4.5	-5.8	-7.5	-11.6	-11.7	-7.5	-4.4	-3.2	-6.3	-8.4	-10.9	-10.3	-7.9
-5.6	-5.2	-3.5	-2.4	-2.4	-1.8	-1.3	-1.3	-1.5	-1.5	-2.0	-3.1	-2.1	-1.7	-1.9	-1.5	-1.2	-1.2	-1.2	-.3	-.7	-1.2	-1.2	-1.7	-1.6	-2.0	-3.7	-5.1	-4.3	-2.0	-.4	-.6	-1.3	-2.5	-4.1	-7.2
-4.9	-4.3	-4.7	-3.1	-5.1	-5.7	-4.5	-2.5	-1.9	-1.6	-1.7	-1.7	-4.4	-5.1	-4.4	-3.3	-1.7	-1.3	-1.1	-.4	-.4	-1.1	-1.4	-1.5	-1.3	-1.5	-1.4	-1.9	-2.7	-3.2	-3.3	-2.2	-.9	-1.6	-1.9	-4.3
-5.7	-5.2	-4.7	-6.2	-5.4	-6.4	-7.1	-6.7	-4.8	-4.9	-4.6	-4.9	-5.3	-6.2	-5.3	-5.7	-5.0	-3.3	-2.2	-2.1	-2.3	-2.9	-3.2	-3.0	-2.1	-2.0	-2.3	-2.4	-2.4	-2.6	-2.9	-3.3	-2.4	-3.5	-4.5	-3.5
-4.4	-4.7	-3.5	-4.0	-3.9	-3.3	-4.4	-5.5	-6.3	-5.8	-5.9	-5.8	-5.7	-5.8	-5.6	-5.7	-6.2	-6.0	-4.4	-4.0	-4.5	-4.4	-4.6	-5.2	-5.3	-5.0	-4.9	-4.6	-4.3	-3.7	-3.8	-4.0	-3.8	-3.7	-3.3	-3.2
-4.4	-4.2	-4.1	-3.6	-4.0	-3.9	-3.8	-4.1	-3.8	-3.9	-4.6	-4.2	-4.2	-4.3	-4.7	-5.0	-5.4	-5.7	-5.5	-4.9	-5.3	-5.5	-5.6	-5.3	-5.5	-5.8	-6.0	-5.8	-6.1	-5.8	-5.0	-5.0	-5.1	-4.8	-4.6	-4.3
-5.0	-4.6	-4.3	-4.4	-4.7	-4.9	-4.9	-4.9	-4.9	-5.0	-5.0	-5.6	-4.9	-4.4	-4.0	-3.3	-3.5	-3.1	-2.9	-2.4	-2.5	-3.1	-3.5	-3.9	-3.9	-4.3	-3.8	-3.7	-3.8	-5.0	-5.3	-4.5	-4.3	-4.6	-4.7	-4.4
-2.5	-3.4	-4.1	-4.4	-4.6	-4.8	-4.4	-4.6	-4.3	-4.3	-5.3	-5.6	-5.3	-5.4	-4.9	-4.1	-3.6	-1.8	-1.3	-.9	-.9	-.7	-.8	-.3	-.5	-1.3	-1.4	-1.0	-1.1	-1.1	-.6	-.1	-.3	-.4	-1.4	-1.8
-1.4	-1.7	-2.1	-1.8	-1.8	-2.3	-2.7	-2.6	-1.8	-.7	-1.1	-1.4	-1.6	-1.5	-1.6	-1.4	-.8	-1.2	-.8	-.2	.5	1.0	1.0	.8	.7	.6	.4	.5	.5	.4	.4	.4	.2	.4	-.2	-1.0

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



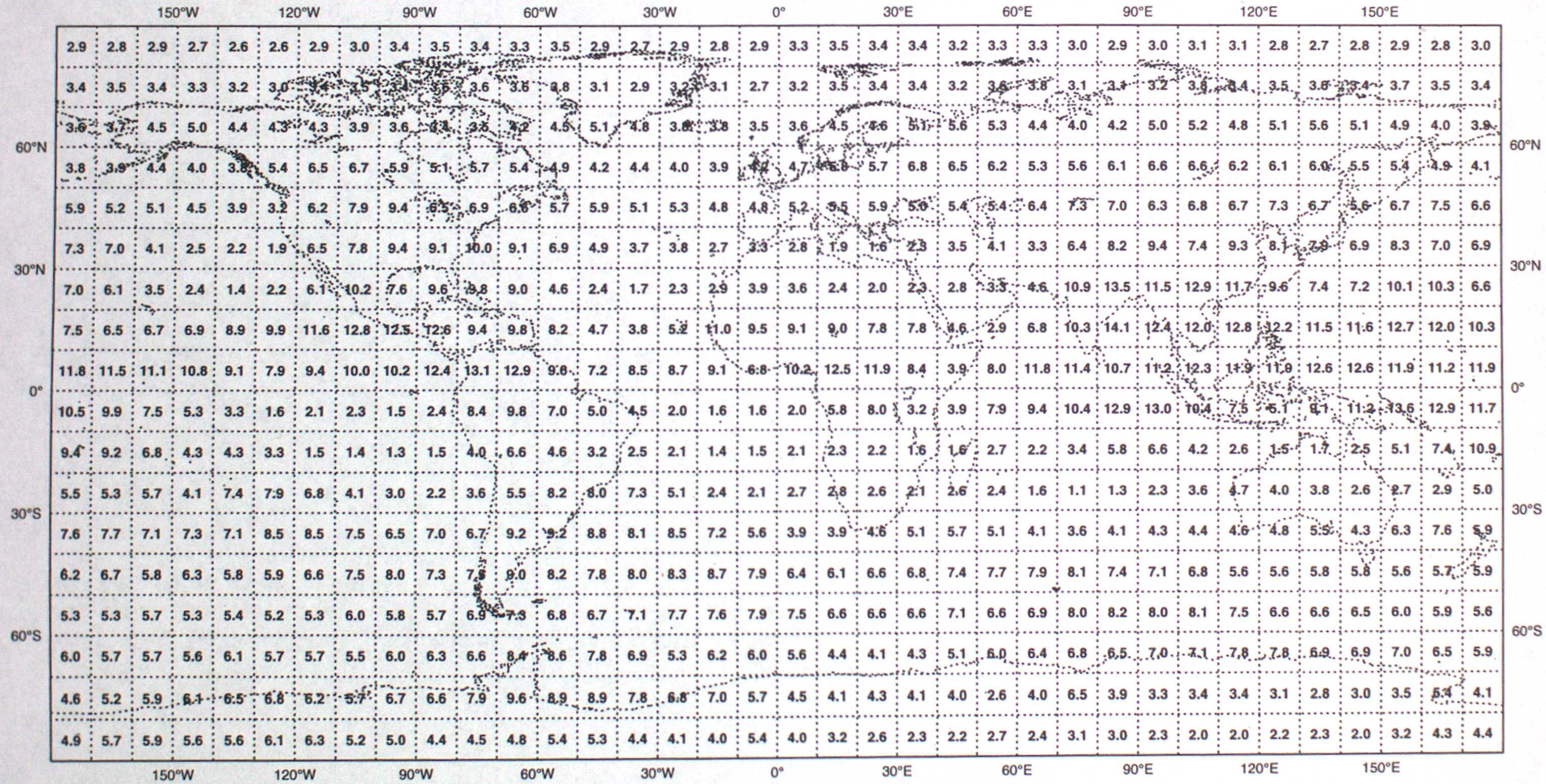
1.9	1.9	2.0	1.9	1.8	1.8	2.0	2.1	2.4	2.6	2.5	2.5	2.4	2.0	1.9	2.3	2.0	1.9	2.5	2.7	2.6	2.7	2.6	2.5	2.4	2.1	2.0	2.0	2.0	2.0	1.7	1.7	1.8	1.9	1.8	1.9
2.5	2.7	2.5	2.3	2.3	2.3	2.6	2.6	2.5	2.8	2.8	2.7	2.8	2.1	1.9	2.7	2.5	2.2	2.6	3.0	2.8	2.9	2.5	2.8	2.9	2.4	2.5	2.5	3.0	2.6	2.8	2.8	2.6	2.6	2.5	2.5
3.1	3.6	4.2	4.6	4.1	4.1	4.1	3.6	3.0	2.7	2.7	3.3	3.7	4.0	3.9	3.8	3.2	3.0	3.2	4.0	4.2	4.5	4.5	4.4	3.8	3.5	3.7	4.2	4.5	4.4	4.5	4.9	4.4	4.2	3.5	3.4
3.5	3.6	4.2	3.9	3.6	4.9	5.9	6.1	5.4	4.9	5.6	5.2	4.5	4.0	3.9	3.5	3.4	3.9	4.3	6.5	5.0	5.6	5.5	5.4	5.0	5.1	5.4	6.0	6.0	5.7	5.8	5.7	5.0	5.1	4.6	4.1
5.9	5.2	5.1	4.3	3.6	3.1	6.3	7.8	8.5	6.4	6.7	6.4	5.4	5.7	5.0	4.9	4.7	4.7	5.1	5.6	5.5	4.6	5.1	5.3	6.3	7.5	7.8	7.3	7.4	6.8	7.3	6.7	5.7	6.4	7.3	6.7
7.4	7.2	4.2	2.5	2.0	1.3	6.9	7.9	8.2	8.1	8.6	8.8	6.5	4.6	3.5	3.8	2.7	3.8	3.3	1.8	1.1	1.6	3.4	4.9	3.7	6.5	8.4	9.4	7.9	9.3	8.6	7.9	6.7	7.8	7.0	7.2
6.7	5.8	3.2	2.0	1.0	2.0	6.1	9.2	6.9	8.5	9.0	8.9	4.1	1.9	1.2	2.0	3.1	3.9	4.0	2.1	.7	2.0	3.4	3.1	4.8	10.1	11.9	10.6	11.9	10.9	9.4	7.0	6.9	9.9	10.1	6.1
6.2	5.4	6.0	6.0	8.0	9.2	10.9	11.4	11.3	11.3	7.9	8.7	7.3	4.2	3.6	5.0	10.2	8.7	8.5	8.8	7.8	8.2	5.7	3.3	6.4	9.9	12.9	11.5	11.0	11.6	10.9	10.6	10.3	11.6	11.3	9.1
10.7	10.5	9.9	9.8	8.4	7.5	9.0	9.4	9.3	11.2	11.6	11.3	8.5	6.5	8.1	8.4	8.7	6.2	9.5	10.8	10.1	8.1	3.6	6.7	11.1	11.0	10.6	10.9	11.6	11.0	11.1	11.7	11.4	10.8	10.2	10.9
9.2	8.7	6.5	4.6	2.8	.9	1.2	1.6	.8	1.7	7.8	8.5	6.1	4.3	3.7	1.2	.9	.6	1.1	4.9	6.7	2.8	2.5	6.2	8.2	9.4	12.1	12.1	9.5	7.1	6.2	8.6	10.3	12.4	11.8	10.6
8.6	8.6	6.5	4.2	4.0	2.9	1.2	.8	.7	.8	3.5	5.5	3.8	2.6	2.0	1.5	.8	.7	1.0	1.3	1.0	1.3	1.2	2.0	1.5	2.5	5.1	6.5	5.4	3.1	1.2	1.1	1.6	3.9	6.4	10.1
6.3	5.7	6.5	4.4	7.3	7.9	6.5	3.8	2.7	1.6	2.9	4.7	7.2	7.5	6.8	5.0	2.4	1.3	1.4	1.7	1.6	1.5	2.4	2.2	1.5	.9	1.0	2.2	3.8	5.3	4.8	4.4	2.8	2.3	2.6	5.9
6.7	7.2	6.5	6.6	6.3	7.6	7.7	7.0	5.8	5.7	5.5	7.1	7.3	7.6	7.0	7.6	6.6	5.0	3.1	3.5	4.3	4.5	4.9	4.6	3.6	3.0	3.2	3.2	3.2	3.8	4.5	5.9	3.9	5.4	6.3	5.1
5.2	5.5	4.7	5.5	5.0	4.8	5.6	6.4	7.0	6.1	6.1	7.1	6.5	6.3	6.7	6.8	7.1	6.3	4.9	4.7	5.2	5.3	5.9	6.2	6.3	6.2	5.8	5.6	5.2	4.4	4.4	4.6	4.4	4.4	4.5	4.6
4.2	4.0	4.3	4.1	4.3	4.0	4.4	5.0	4.5	4.2	5.2	5.1	4.9	5.0	5.2	5.8	5.6	6.0	5.7	4.9	4.8	4.7	5.0	4.7	5.0	5.7	6.0	5.9	6.0	5.5	4.8	4.8	4.8	4.4	4.4	4.2
4.5	4.1	4.0	4.0	4.4	4.1	4.2	4.0	4.4	4.7	4.7	5.7	5.8	5.2	4.4	3.3	4.1	4.0	3.9	3.0	2.8	2.9	3.4	4.0	4.4	4.7	4.4	4.7	4.8	5.4	5.4	4.8	4.7	4.9	4.8	4.4
3.3	3.7	4.0	4.1	4.5	4.5	4.0	3.8	4.7	4.7	5.9	6.7	6.5	6.4	5.3	4.5	4.4	3.3	2.5	2.1	2.3	2.4	2.3	1.3	2.0	3.4	2.1	1.8	2.2	2.2	1.9	1.6	1.9	2.0	2.8	2.7
2.2	2.8	3.2	3.2	3.2	3.7	3.8	3.2	3.0	2.6	2.6	2.7	3.2	3.2	2.8	2.5	2.4	3.6	2.7	2.0	1.3	.9	1.0	1.2	1.3	1.6	1.5	1.1	.9	.9	.8	.8	.8	1.2	1.7	2.0

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



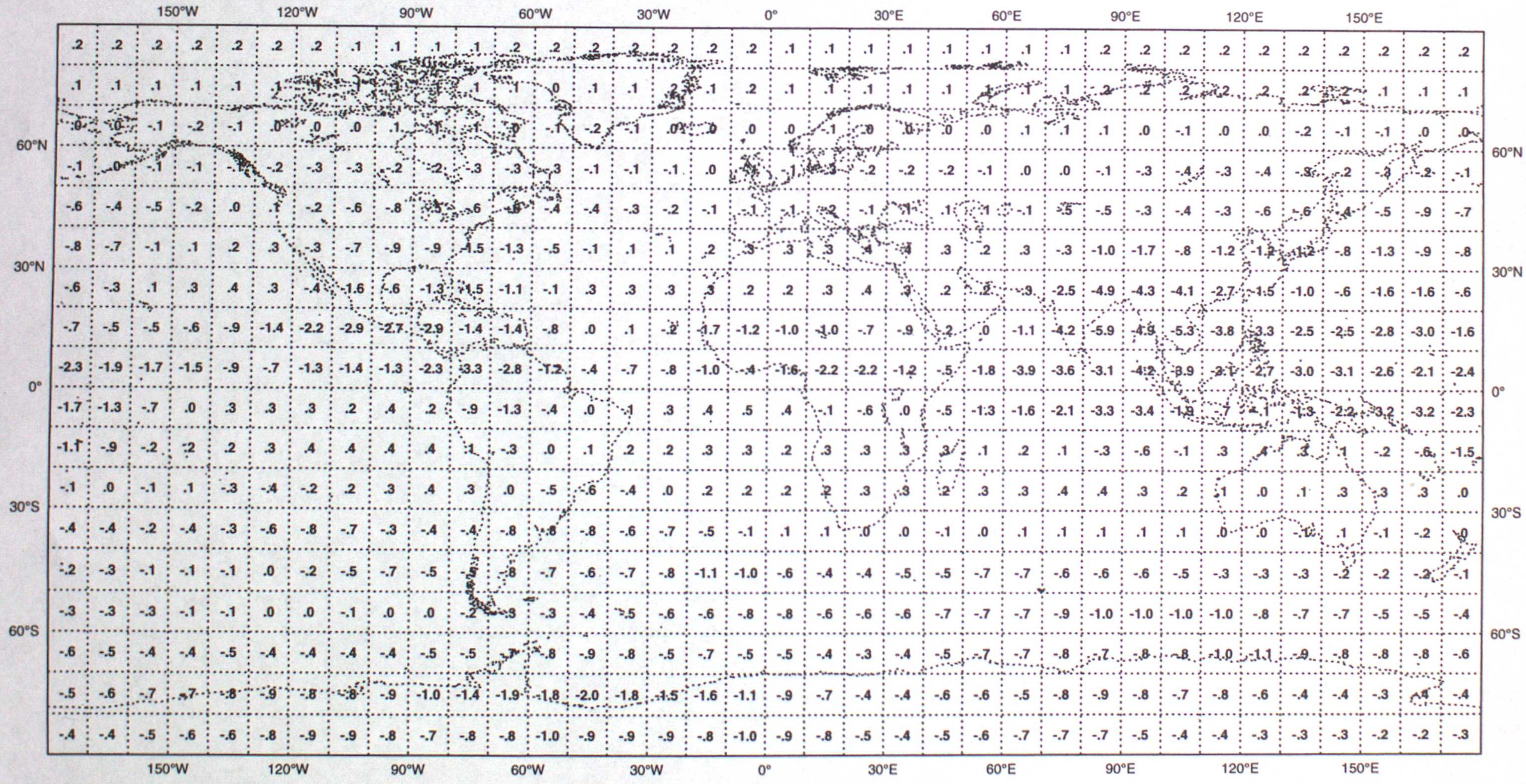
-1.6	-1.6	-1.5	-1.6	-1.7	-2.0	-2.2	-2.4	-2.6	-2.7	-2.5	-2.3	-2.2	-1.8	-1.5	-1.4	-1.4	-1.4	-1.7	-1.8	-1.6	-1.7	-1.6	-1.5	-1.5	-1.3	-1.1	-1.1	-1.1	-1.1	-1.0	-1.1	-1.2	-1.5	-1.7	-1.6
-2.2	-2.3	-1.7	-1.6	-1.7	-1.6	-2.1	-2.4	-2.2	-1.4	-2.6	-2.5	-2.6	-2.6	-2.3	-1.7	-1.6	-1.2	-1.5	-1.8	-1.4	-1.2	-.9	-.8	-1.0	-.9	-.9	-.8	-1.3	-.9	-1.1	-1.7	-1.8	-2.0	-2.0	-2.1
-2.0	-1.9	-2.6	-3.3	-2.7	-2.2	-1.7	-1.7	-1.5	-1.7	-2.1	-2.7	-2.8	-3.8	-3.1	-1.8	-2.1	-1.9	-2.1	-3.0	-2.5	-2.1	-1.2	-1.4	-1.3	-1.1	-1.4	-2.2	-2.1	-1.9	-2.0	-3.0	-2.2	-2.0	-1.9	-2.8
-1.8	-1.8	-2.4	-2.0	-1.9	-3.0	-3.3	-3.1	-2.5	-2.9	-3.1	-3.1	-2.7	-2.0	-2.0	-1.7	-1.9	-2.2	-2.3	-3.4	-2.7	-2.9	-2.5	-1.8	-1.5	-1.9	-2.5	-3.3	-3.4	-3.0	-3.2	-2.6	-2.3	-3.1	-2.5	-1.9
-3.3	-2.6	-2.7	-1.8	-1.0	-.6	-2.2	-3.5	-4.2	-3.2	-3.9	-3.4	-2.2	-2.6	-1.9	-2.1	-1.7	-1.7	-2.0	-2.2	-2.0	-1.1	-1.5	-1.5	-2.6	-3.6	-3.5	-3.1	-3.5	-2.5	-3.2	-3.2	-2.3	-2.9	-3.9	-3.8
-3.2	-3.1	-1.2	-.3	.0	.1	-1.7	-3.2	-3.7	-3.9	-5.7	-5.3	-2.5	-1.2	-.3	-.5	.1	-.9	-.5	.1	-.1	-.1	-.3	-1.2	-.7	-1.3	-3.6	-5.8	-3.9	-4.7	-5.3	-4.2	-3.1	-4.3	-3.1	-3.0
-2.6	-1.8	-.4	.1	.5	.4	-1.6	-6.5	-2.7	-4.5	-5.3	-4.2	-1.3	-.2	.3	.3	-.7	-2.3	-1.9	.3	.6	-.3	-.6	-.9	-1.6	-5.9	-11.9	-11.5	-11.7	-7.6	-4.8	-3.1	-2.5	-5.1	-5.4	-2.6
-2.3	-1.6	-1.8	-1.9	-3.4	-4.1	-6.1	-8.4	-8.5	-8.7	-4.7	-4.1	-2.7	-.5	-.1	-1.0	-7.4	-6.1	-5.0	-4.4	-2.6	-2.6	-.4	.2	-2.1	-10.6	-14.4	-13.0	-13.8	-9.3	-8.6	-6.8	-6.6	-7.8	-8.1	-4.8
-6.4	-5.6	-5.3	-4.7	-3.2	-2.3	-3.9	-4.5	-4.3	-7.0	-10.9	-9.1	-3.6	-1.0	-2.0	-2.6	-3.3	-1.9	-5.5	-6.8	-6.0	-3.1	-1.2	-4.6	-10.1	-9.9	-8.6	-12.2	-11.3	-9.6	-7.6	-8.3	-8.3	-7.0	-6.0	-6.9
-5.2	-4.3	-2.6	-1.0	.3	.4	.3	.2	.4	.2	-4.4	-5.3	-3.7	-2.3	-.9	.6	.7	.9	1.2	-1.6	-3.1	-.4	-1.0	-3.1	-4.2	-5.8	-9.5	-10.3	-6.4	-2.6	-.7	-4.5	-6.4	-8.9	-9.1	-7.0
-3.6	-3.1	-1.2	-.3	-.1	.3	.7	.5	.6	.6	-.5	-1.8	-2.5	-1.9	-.5	.3	.4	.5	.8	.9	1.0	.7	.7	.5	.7	.1	-1.3	-2.4	-1.1	.0	.4	-.4	-.6	-1.2	-2.8	-5.4
-2.2	-1.3	-1.6	-.7	-2.7	-3.1	-2.0	-.2	.2	.1	-.2	-1.4	-3.7	-3.8	-2.3	-1.0	.5	.5	.4	.7	1.0	.6	.7	.9	1.0	.7	.7	.5	-.1	-1.1	-1.5	-1.1	-.6	-.2	.0	-1.7
-4.0	-3.3	-2.7	-4.3	-3.8	-4.8	-5.3	-4.6	-2.7	-3.3	-3.4	-5.2	-5.0	-5.0	-3.9	-4.0	-3.3	-1.4	-.5	-.6	-.9	-1.4	-1.6	-1.1	-.2	-.2	-.5	-.7	-.9	-1.1	-1.3	-1.6	-1.5	-2.5	-3.1	-1.9
-3.0	-3.6	-2.3	-2.7	-2.5	-2.1	-3.3	-4.4	-5.2	-4.7	-5.2	-6.0	-5.2	-5.1	-4.9	-5.0	-5.6	-5.5	-3.4	-3.0	-3.4	-3.6	-4.0	-4.6	-4.6	-4.0	-3.9	-3.7	-3.5	-2.7	-2.8	-2.9	-2.7	-2.6	-2.4	-2.4
-3.7	-3.7	-3.7	-2.8	-3.0	-2.9	-2.6	-3.1	-3.1	-3.3	-4.2	-4.1	-4.1	-4.3	-4.8	-5.2	-5.6	-6.2	-6.1	-5.4	-5.9	-6.1	-6.4	-5.6	-5.9	-6.4	-6.6	-6.4	-6.9	-6.2	-5.1	-4.9	-4.9	-4.4	-3.8	-3.5
-6.0	-5.7	-5.1	-5.1	-5.4	-5.4	-5.3	-5.2	-5.1	-5.4	-5.8	-6.3	-6.7	-6.0	-5.5	-4.7	-5.2	-4.7	-4.6	-4.1	-4.4	-5.0	-5.5	-5.7	-5.5	-5.9	-5.7	-5.5	-5.6	-7.0	-7.2	-6.2	-5.9	-6.3	-6.5	-5.6
-4.7	-6.0	-7.0	-7.0	-7.1	-7.4	-6.8	-7.0	-6.6	-6.4	-8.2	-9.2	-8.8	-8.6	-8.1	-6.9	-6.3	-3.5	-3.2	-2.7	-2.5	-2.2	-2.7	-2.3	-1.7	-2.7	-3.9	-3.6	-4.5	-4.6	-3.9	-2.2	-2.6	-2.7	-3.4	-4.0
-4.3	-5.4	-6.0	-4.8	-4.5	-5.5	-6.1	-6.0	-4.8	-2.5	-3.4	-4.7	-4.9	-4.3	-4.5	-4.0	-3.0	-3.9	-3.6	-3.1	-1.8	-1.4	-1.7	-1.8	-1.8	-2.6	-3.3	-2.9	-3.1	-2.8	-2.6	-2.5	-3.0	-.9	-1.8	-3.4

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



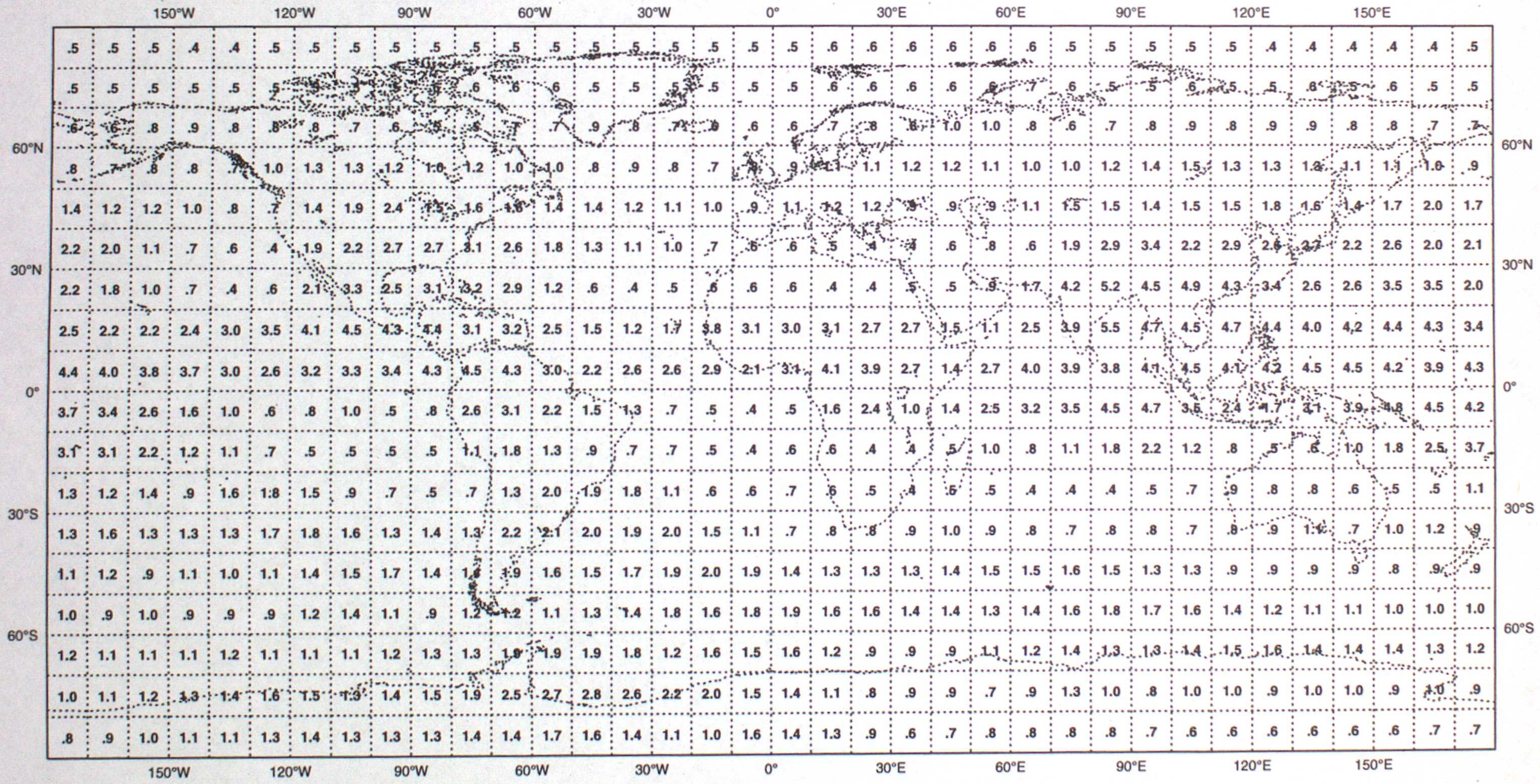
2.9	2.8	2.9	2.7	2.6	2.6	2.9	3.0	3.4	3.5	3.4	3.3	3.5	2.9	2.7	2.9	2.8	2.9	3.3	3.5	3.4	3.4	3.2	3.3	3.3	3.0	2.9	3.0	3.1	3.1	2.8	2.7	2.8	2.9	2.8	3.0
3.4	3.5	3.4	3.3	3.2	3.0	3.4	3.5	3.4	3.5	3.6	3.6	3.8	3.1	2.9	3.2	3.1	2.7	3.2	3.5	3.4	3.4	3.2	3.6	3.8	3.1	3.1	3.2	3.6	3.4	3.5	3.6	3.4	3.7	3.5	3.4
3.6	3.7	4.5	5.0	4.4	4.3	4.3	3.9	3.6	3.4	3.5	4.2	4.5	5.1	4.8	3.8	3.8	3.5	3.6	4.5	4.6	5.1	5.6	5.3	4.4	4.0	4.2	5.0	5.2	4.8	5.1	5.6	5.1	4.9	4.0	3.9
3.8	3.9	4.4	4.0	3.8	5.4	6.5	6.7	5.9	5.1	5.7	5.4	4.9	4.2	4.4	4.0	3.9	4.2	4.7	6.8	5.7	6.8	6.5	6.2	5.3	5.6	6.1	6.6	6.6	6.2	6.1	6.0	5.5	5.4	4.9	4.1
5.9	5.2	5.1	4.5	3.9	3.2	6.2	7.9	9.4	6.5	6.9	6.6	5.7	5.9	5.1	5.3	4.8	4.8	5.2	5.5	5.9	5.0	5.4	5.4	6.4	7.3	7.0	6.3	6.8	6.7	7.3	6.7	5.6	6.7	7.5	6.6
7.3	7.0	4.1	2.5	2.2	1.9	6.5	7.8	9.4	9.1	10.0	9.1	6.9	4.9	3.7	3.8	2.7	3.3	2.8	1.9	1.6	2.3	3.5	4.1	3.3	6.4	8.2	9.4	7.4	9.3	8.1	7.9	6.9	8.3	7.0	6.9
7.0	6.1	3.5	2.4	1.4	2.2	6.1	10.2	7.6	9.6	9.8	9.0	4.6	2.4	1.7	2.3	2.9	3.9	3.6	2.4	2.0	2.3	2.8	3.3	4.6	10.9	13.5	11.5	12.9	11.7	9.6	7.4	7.2	10.1	10.3	6.6
7.5	6.5	6.7	6.9	8.9	9.9	11.6	12.8	12.5	12.6	9.4	9.8	8.2	4.7	3.8	5.2	11.0	9.5	9.1	9.0	7.8	7.8	4.6	2.9	6.8	10.3	14.1	12.4	12.0	12.8	12.2	11.5	11.6	12.7	12.0	10.3
11.8	11.5	11.1	10.8	9.1	7.9	9.4	10.0	10.2	12.4	13.1	12.9	9.6	7.2	8.5	8.7	9.1	6.8	10.2	12.5	11.9	8.4	3.9	8.0	11.8	11.4	10.7	11.2	12.3	11.9	11.9	12.6	12.6	11.9	11.2	11.9
10.5	9.9	7.5	5.3	3.3	1.6	2.1	2.3	1.5	2.4	8.4	9.8	7.0	5.0	4.5	2.0	1.6	1.6	2.0	5.8	8.0	3.2	3.9	7.9	9.4	10.4	12.9	13.0	10.4	7.5	5.1	8.1	11.2	13.6	12.9	11.7
9.4	9.2	6.8	4.3	4.3	3.3	1.5	1.4	1.3	1.5	4.0	6.6	4.6	3.2	2.5	2.1	1.4	1.5	2.1	2.3	2.2	1.6	1.6	2.7	2.2	3.4	5.8	6.6	4.2	2.6	1.5	1.7	2.5	5.1	7.4	10.9
5.5	5.3	5.7	4.1	7.4	7.9	6.8	4.1	3.0	2.2	3.6	5.5	8.2	8.0	7.3	5.1	2.4	2.1	2.7	2.8	2.6	2.1	2.6	2.4	1.6	1.1	1.3	2.3	3.6	4.7	4.0	3.8	2.6	2.7	2.9	5.0
7.6	7.7	7.1	7.3	7.1	8.5	8.5	7.5	6.5	7.0	6.7	9.2	9.2	8.8	8.1	8.5	7.2	5.6	3.9	3.9	4.6	5.1	5.7	5.1	4.1	3.6	4.1	4.3	4.4	4.6	4.8	5.5	4.3	6.3	7.6	5.9
6.2	6.7	5.8	6.3	5.8	5.9	6.6	7.5	8.0	7.3	7.8	9.0	8.2	7.8	8.0	8.3	8.7	7.9	6.4	6.1	6.6	6.8	7.4	7.7	7.9	8.1	7.4	7.1	6.8	5.6	5.6	5.8	5.8	5.6	5.7	5.9
5.3	5.3	5.7	5.3	5.4	5.2	5.3	6.0	5.8	5.7	6.9	7.3	6.8	6.7	7.1	7.7	7.6	7.9	7.5	6.6	6.6	6.6	7.1	6.6	6.9	8.0	8.2	8.0	8.1	7.5	6.6	6.6	6.5	6.0	5.9	5.6
6.0	5.7	5.7	5.6	6.1	5.7	5.7	5.5	6.0	6.3	6.6	8.4	8.6	7.8	6.9	5.3	6.2	6.0	5.6	4.4	4.1	4.3	5.1	6.0	6.4	6.8	6.5	7.0	7.1	7.8	7.8	6.9	6.9	7.0	6.5	5.9
4.6	5.2	5.9	6.1	6.5	6.8	6.2	5.7	6.7	6.6	7.9	9.6	8.9	8.9	7.8	6.8	7.0	5.7	4.5	4.1	4.3	4.1	4.0	2.6	4.0	6.5	3.9	3.3	3.4	3.4	3.1	2.8	3.0	3.5	5.4	4.1
4.9	5.7	5.9	5.6	5.6	6.1	6.3	5.2	5.0	4.4	4.5	4.8	5.4	5.3	4.4	4.1	4.0	5.4	4.0	3.2	2.6	2.3	2.2	2.7	2.4	3.1	3.0	2.3	2.0	2.0	2.2	2.3	2.0	3.2	4.3	4.4

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



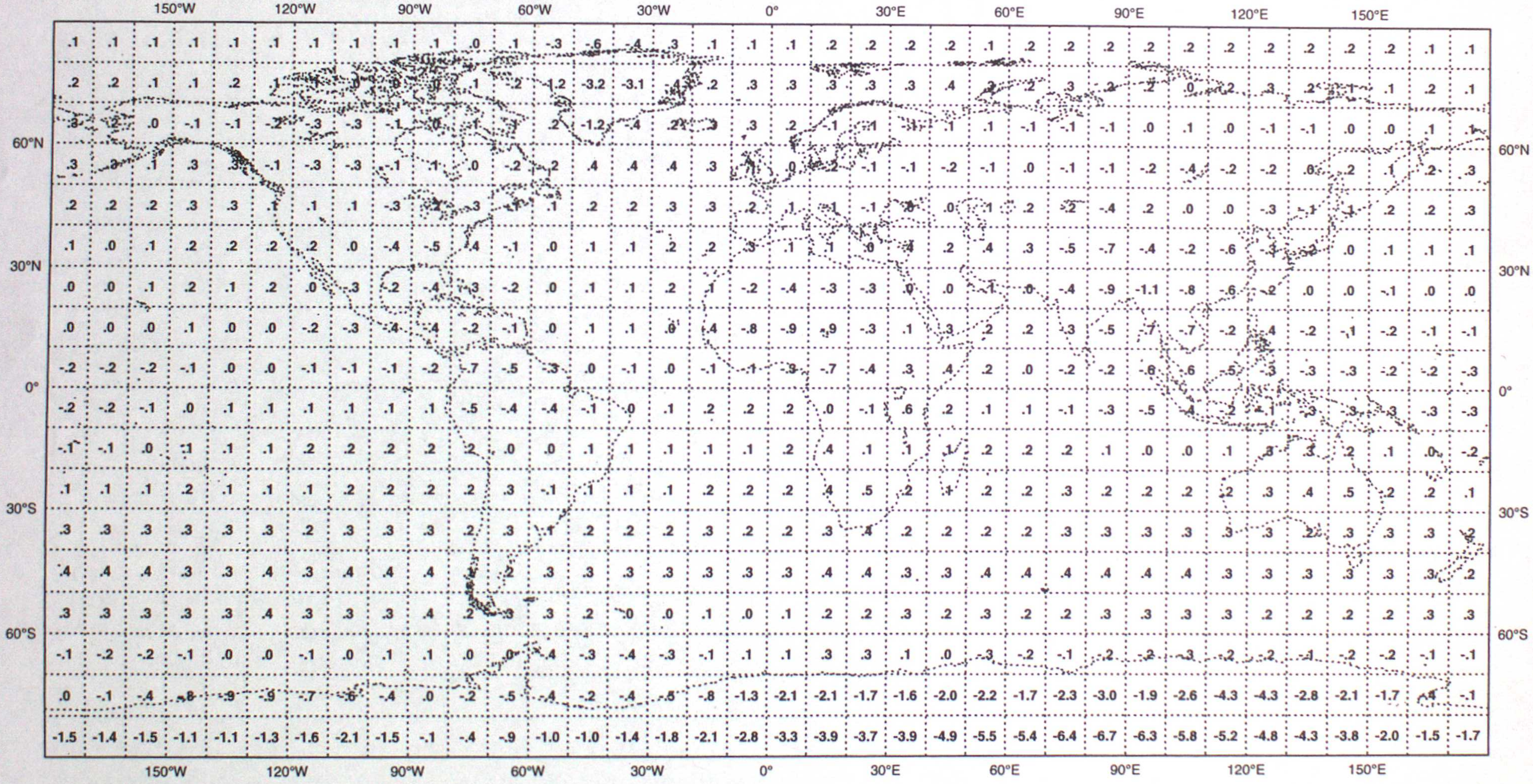
.2	.2	.2	.2	.2	.2	.2	.1	.1	.1	.1	.2	.2	.2	.2	.2	.2	.2	.1	.1	.1	.1	.1	.1	.1	.1	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.0	.1	.1	.2	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1	.2	.2	.2	.2	.2	.2	.2	.1	.1	.1
.0	.0	-.1	-.2	-.1	.0	.0	.0	.1	.1	.1	.0	-.1	-.2	-.1	.0	.0	.0	.0	-.1	.0	.0	.0	.0	.1	.1	.1	.0	-.1	.0	.0	-.2	-.1	-.1	.0	.0
-.1	.0	-.1	-.1	-.1	-.2	-.3	-.3	-.2	-.2	-.3	-.3	-.3	-.1	-.1	-.1	.0	[illegible]	-.1	-.3	-.2	-.2	-.2	-.1	.0	.0	-.1	-.3	-.4	-.3	-.4	-.3	-.2	-.3	-.2	-.1
-.6	-.4	-.5	-.2	.0	.1	-.2	-.6	-.8	-.5	-.6	-.6	-.4	-.4	-.3	-.2	-.1	-.1	-.1	-.2	-.1	.1	.1	.1	-.1	-.5	-.5	-.3	-.4	-.3	-.6	-.6	-.4	-.5	-.9	-.7
-.8	-.7	-.1	.1	.2	.3	-.3	-.7	-.9	-.9	-1.5	-1.3	-.5	-.1	.1	.1	.2	.3	.3	.3	.4	.4	.3	.2	.3	-.3	-1.0	-1.7	-.8	-1.2	-1.2	-1.2	-.8	-1.3	-.9	-.8
-.6	-.3	.1	.3	.4	.3	-.4	-1.6	-.6	-1.3	-1.5	-1.1	-.1	.3	.3	.3	.3	.2	.2	.3	.4	.3	.2	.2	-.3	-2.5	-4.9	-4.3	-4.1	-2.7	-1.5	-1.0	-.6	-1.6	-1.6	-.6
-.7	-.5	-.5	-.6	-.9	-1.4	-2.2	-2.9	-2.7	-2.9	-1.4	-1.4	-.8	.0	.1	-.2	-1.7	-1.2	-1.0	-1.0	-.7	-.9	-.2	.0	-1.1	-4.2	-5.9	-4.9	-5.3	-3.8	-3.3	-2.5	-2.5	-2.8	-3.0	-1.6
-2.3	-1.9	-1.7	-1.5	-.9	-.7	-1.3	-1.4	-1.3	-2.3	-3.3	-2.8	-1.2	-.4	-.7	-.8	-1.0	-.4	-1.6	-2.2	-2.2	-1.2	-.5	-1.8	-3.9	-3.6	-3.1	-4.2	-3.9	-3.1	-2.7	-3.0	-3.1	-2.6	-2.1	-2.4
-1.7	-1.3	-.7	.0	.3	.3	.3	.2	.4	.2	-.9	-1.3	-.4	.0	.1	.3	.4	.5	.4	-.1	-.6	.0	-.5	-1.3	-1.6	-2.1	-3.3	-3.4	-1.9	-.7	-.1	-1.3	-2.2	-3.2	-3.2	-2.3
-1.1	-.9	-.2	.2	.2	.3	.4	.4	.4	.4	.1	-.3	.0	.1	.2	.2	.3	.3	.2	.3	.3	.3	.3	.1	.2	.1	-.3	-.6	-.1	.3	.4	.3	.1	-.2	-.6	-1.5
-.1	.0	-.1	.1	-.3	-.4	-.2	.2	.3	.4	.3	.0	-.5	-.6	-.4	.0	.2	.2	.2	.2	.3	.3	.2	.3	.3	.4	.4	.3	.2	.1	.0	.1	.3	.3	.3	.0
-.4	-.4	-.2	-.4	-.3	-.6	-.8	-.7	-.3	-.4	-.4	-.8	-.8	-.8	-.6	-.7	-.5	-.1	.1	.1	.0	.0	-.1	.0	.1	.1	.1	.1	.1	.0	.0	-.1	.1	-.1	-.2	.0
-.2	-.3	-.1	-.1	-.1	.0	-.2	-.5	-.7	-.5	-.5	-.8	-.7	-.6	-.7	-.8	-1.1	-1.0	-.6	-.4	-.4	-.5	-.5	-.7	-.7	-.6	-.6	-.6	-.5	-.3	-.3	-.3	-.2	-.2	-.2	-.1
-.3	-.3	-.3	-.1	-.1	.0	.0	-.1	.0	.0	-.2	-.3	-.3	-.4	-.5	-.6	-.6	-.8	-.8	-.6	-.6	-.6	-.7	-.7	-.7	-.9	-1.0	-1.0	-1.0	-1.0	-.8	-.7	-.7	-.5	-.5	-.4
-.6	-.5	-.4	-.4	-.5	-.4	-.4	-.4	-.4	-.5	-.5	-.7	-.8	-.9	-.8	-.5	-.7	-.5	-.5	-.4	-.3	-.4	-.5	-.7	-.7	-.8	-.7	-.8	-.8	-1.0	-1.1	-.9	-.8	-.8	-.8	-.6
-.5	-.6	-.7	-.7	-.8	-.9	-.8	-.8	-.9	-1.0	-1.4	-1.9	-1.8	-2.0	-1.8	-1.5	-1.6	-1.1	-.9	-.7	-.4	-.4	-.6	-.6	-.5	-.8	-.9	-.8	-.7	-.8	-.6	-.4	-.4	-.3	-.4	-.4
-.4	-.4	-.5	-.6	-.6	-.8	-.9	-.9	-.8	-.7	-.8	-.8	-1.0	-.9	-.9	-.9	-.8	-1.0	-.9	-.8	-.5	-.4	-.5	-.6	-.7	-.7	-.7	-.5	-.4	-.4	-.3	-.3	-.3	-.2	-.2	-.3

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



.5	.5	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.6	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.7	.6	.5	.5	.6	.5	.5	.6	.5	.6	.5	.5
.6	.6	.8	.9	.8	.8	.8	.7	.6	.5	.5	.7	.7	.9	.8	.7	.9	.6	.6	.7	.8	.8	1.0	1.0	.8	.6	.7	.8	.9	.8	.9	.9	.8	.8	.7	.7
.8	.7	.8	.8	.7	1.0	1.3	1.3	1.2	1.0	1.2	1.0	1.0	.8	.9	.8	.7	.9	.9	1.1	1.1	1.2	1.2	1.1	1.0	1.0	1.2	1.4	1.5	1.3	1.3	1.3	1.1	1.1	1.0	.9
1.4	1.2	1.2	1.0	.8	.7	1.4	1.9	2.4	1.5	1.6	1.6	1.4	1.4	1.2	1.1	1.0	.9	1.1	1.2	1.2	.9	.9	.9	1.1	1.5	1.5	1.4	1.5	1.5	1.8	1.6	1.4	1.7	2.0	1.7
2.2	2.0	1.1	.7	.6	.4	1.9	2.2	2.7	2.7	3.1	2.6	1.8	1.3	1.1	1.0	.7	.6	.6	.5	.4	.4	.6	.8	.6	1.9	2.9	3.4	2.2	2.9	2.6	2.7	2.2	2.6	2.0	2.1
2.2	1.8	1.0	.7	.4	.6	2.1	3.3	2.5	3.1	3.2	2.9	1.2	.6	.4	.5	.6	.6	.6	.4	.4	.5	.5	.9	1.7	4.2	5.2	4.5	4.9	4.3	3.4	2.6	2.6	3.5	3.5	2.0
2.5	2.2	2.2	2.4	3.0	3.5	4.1	4.5	4.3	4.4	3.1	3.2	2.5	1.5	1.2	1.7	3.8	3.1	3.0	3.1	2.7	2.7	1.5	1.1	2.5	3.9	5.5	4.7	4.5	4.7	4.4	4.0	4.2	4.4	4.3	3.4
4.4	4.0	3.8	3.7	3.0	2.6	3.2	3.3	3.4	4.3	4.5	4.3	3.0	2.2	2.6	2.6	2.9	2.1	3.1	4.1	3.9	2.7	1.4	2.7	4.0	3.9	3.8	4.1	4.5	4.1	4.2	4.5	4.5	4.2	3.9	4.3
3.7	3.4	2.6	1.6	1.0	.6	.8	1.0	.5	.8	2.6	3.1	2.2	1.5	1.3	.7	.5	.4	.5	1.6	2.4	1.0	1.4	2.5	3.2	3.5	4.5	4.7	3.5	2.4	4.7	3.1	3.9	4.8	4.5	4.2
3.1	3.1	2.2	1.2	1.1	.7	.5	.5	.5	.5	1.1	1.8	1.3	.9	.7	.7	.5	.4	.6	.6	.4	.4	.5	1.0	.8	1.1	1.8	2.2	1.2	.8	.5	.6	1.0	1.8	2.5	3.7
1.3	1.2	1.4	.9	1.6	1.8	1.5	.9	.7	.5	.7	1.3	2.0	1.9	1.8	1.1	.6	.6	.7	.6	.5	.4	.5	.5	.4	.4	.4	.5	.7	.9	.8	.8	.6	.5	.5	1.1
1.3	1.6	1.3	1.3	1.3	1.7	1.8	1.6	1.3	1.4	1.3	2.2	2.1	2.0	1.9	2.0	1.5	1.1	.7	.8	.8	.9	1.0	.9	.8	.7	.8	.8	.7	.8	.9	1.1	.7	1.0	1.2	.9
1.1	1.2	.9	1.1	1.0	1.1	1.4	1.5	1.7	1.4	1.6	1.9	1.6	1.5	1.7	1.9	2.0	1.9	1.4	1.3	1.3	1.3	1.4	1.5	1.5	1.6	1.5	1.3	1.3	.9	.9	.9	.9	.8	.9	.9
1.0	.9	1.0	.9	.9	.9	1.2	1.4	1.1	.9	1.2	1.2	1.1	1.3	1.4	1.8	1.6	1.8	1.9	1.6	1.6	1.4	1.4	1.3	1.4	1.6	1.8	1.7	1.6	1.4	1.2	1.1	1.1	1.0	1.0	1.0
1.2	1.1	1.1	1.1	1.2	1.1	1.1	1.1	1.2	1.3	1.3	1.9	1.9	1.9	1.8	1.2	1.6	1.5	1.6	1.2	.9	.9	.9	1.1	1.2	1.4	1.3	1.3	1.4	1.5	1.6	1.4	1.4	1.4	1.3	1.2
1.0	1.1	1.2	1.3	1.4	1.6	1.5	1.3	1.4	1.5	1.9	2.5	2.7	2.8	2.6	2.2	2.0	1.5	1.4	1.1	.8	.9	.9	.7	.9	1.3	1.0	.8	1.0	1.0	.9	1.0	1.0	.9	1.0	.9
.8	.9	1.0	1.1	1.1	1.3	1.4	1.3	1.3	1.3	1.4	1.4	1.7	1.6	1.4	1.1	1.0	1.6	1.4	1.3	.9	.6	.7	.8	.8	.8	.8	.7	.6	.6	.6	.6	.6	.6	.7	.7

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.0	.1	-.3	-.6	-.4	.3	.1	.1	.1	.2	.2	.2	.2	.1	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.1	.1
.2	.2	.1	.1	.2	.1	.1	.0	.0	.0	.1	.2	-1.2	-3.2	-3.1	-.4	.2	.3	.3	.3	.3	.3	.4	.2	.2	.3	.2	.2	.0	.2	.3	.2	.1	.1	.2	.1
.3	.2	.0	-.1	-.1	-.2	-.3	-.3	-.1	.0	.1	.1	.2	-1.2	-.4	.2	.3	.3	.2	-.1	-.1	-.1	.1	.1	-.1	-.1	-.1	.0	.1	.0	-.1	-.1	.0	.0	.1	.1
.3	.3	.1	.3	.3	-.1	-.3	-.3	-.1	.1	.0	-.2	.2	.4	.4	.4	.3	.1	.0	.2	-.1	-.1	-.2	-.1	.0	-.1	-.1	-.2	-.4	-.2	-.2	.0	.2	.1	.2	.3
.2	.2	.2	.3	.3	.1	.1	.1	-.3	-.2	-.3	.1	.1	.2	.2	.3	.3	.2	.1	-.1	-.1	.0	.0	.1	.2	.2	-.4	.2	.0	.0	-.3	-.1	-.1	.2	.2	.3
.1	.0	.1	.2	.2	.2	.2	.0	-.4	-.5	.4	-.1	.0	.1	.1	.2	.2	.3	.1	.1	.0	.4	.2	.4	.3	-.5	-.7	-.4	-.2	-.6	-.3	-.2	.0	.1	.1	.1
.0	.0	.1	.2	.1	.2	.0	-.3	-.2	-.4	-.3	-.2	.0	.1	.1	.2	.1	-.2	-.4	-.3	-.3	.0	.0	-.1	.0	-.4	-.9	-1.1	-.8	-.6	-.2	.0	.0	-.1	.0	.0
.0	.0	.0	.1	.0	.0	-.2	-.3	-.4	-.4	-.2	-.1	.0	.1	.1	.0	.4	-.8	-.9	-.9	-.3	.1	.3	.2	.2	-.3	-.5	-.7	-.7	-.2	-.4	-.2	-.1	-.2	-.1	-.1
-.2	-.2	-.2	-.1	.0	.0	-.1	-.1	-.1	-.2	-.7	-.5	-.3	.0	-.1	.0	-.1	-.1	-.3	-.7	-.4	.3	.4	.2	.0	-.2	-.2	-.6	.6	-.5	-.3	-.3	-.3	-.2	-.2	-.3
-.2	-.2	-.1	.0	.1	.1	.1	.1	.1	.1	-.5	-.4	-.4	-.1	.0	.1	.2	.2	.2	.0	-.1	.6	.2	.1	.1	-.1	-.3	-.5	-.4	-.2	-.1	-.3	-.3	-.3	-.3	-.3
-.1	-.1	.0	.1	.1	.1	.2	.2	.2	.2	.2	.0	.0	.1	.1	.1	.1	.1	.2	.4	.1	.1	.1	.2	.2	.2	.1	.0	.0	.1	.3	.3	.2	.1	.0	-.2
.1	.1	.1	.2	.1	.1	.1	.2	.2	.2	.2	.3	-.1	.1	.1	.1	.2	.2	.2	.4	.5	.2	.1	.2	.2	.3	.2	.2	.2	.2	.3	.4	.5	.2	.2	.1
.3	.3	.3	.3	.3	.3	.2	.3	.3	.3	.2	.3	.1	.2	.2	.2	.3	.2	.2	.3	.4	.2	.2	.2	.2	.3	.3	.3	.3	.3	.3	.2	.3	.3	.3	.2
.4	.4	.4	.3	.3	.4	.3	.4	.4	.4	.1	.2	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.2
.3	.3	.3	.3	.3	.4	.3	.3	.3	.4	.2	.3	.3	.2	.0	.0	.1	.0	.1	.2	.2	.3	.2	.3	.2	.2	.3	.3	.3	.3	.2	.2	.2	.2	.3	.3
-.1	-.2	-.2	-.1	.0	.0	-.1	.0	.1	.1	.0	.0	-.4	-.3	-.4	-.3	-.1	.1	.1	.3	.3	.1	.0	-.3	-.2	-.1	-.2	-.2	-.3	-.2	-.2	-.1	-.2	-.2	-.1	-.1
.0	-.1	-.4	-.8	-.9	-.9	-.7	-.6	-.4	.0	-.2	-.5	-.4	-.2	-.4	-.5	-.8	-1.3	-2.1	-2.1	-1.7	-1.6	-2.0	-2.2	-1.7	-2.3	-3.0	-1.9	-2.6	-4.3	-4.3	-2.8	-2.1	-1.7	-.4	-.1
-1.5	-1.4	-1.5	-1.1	-1.1	-1.3	-1.6	-2.1	-1.5	-.1	-.4	-.9	-1.0	-1.0	-1.4	-1.8	-2.1	-2.8	-3.3	-3.9	-3.7	-3.9	-4.9	-5.5	-5.4	-6.4	-6.7	-6.3	-5.8	-5.2	-4.8	-4.3	-3.8	-2.0	-1.5	-1.7

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

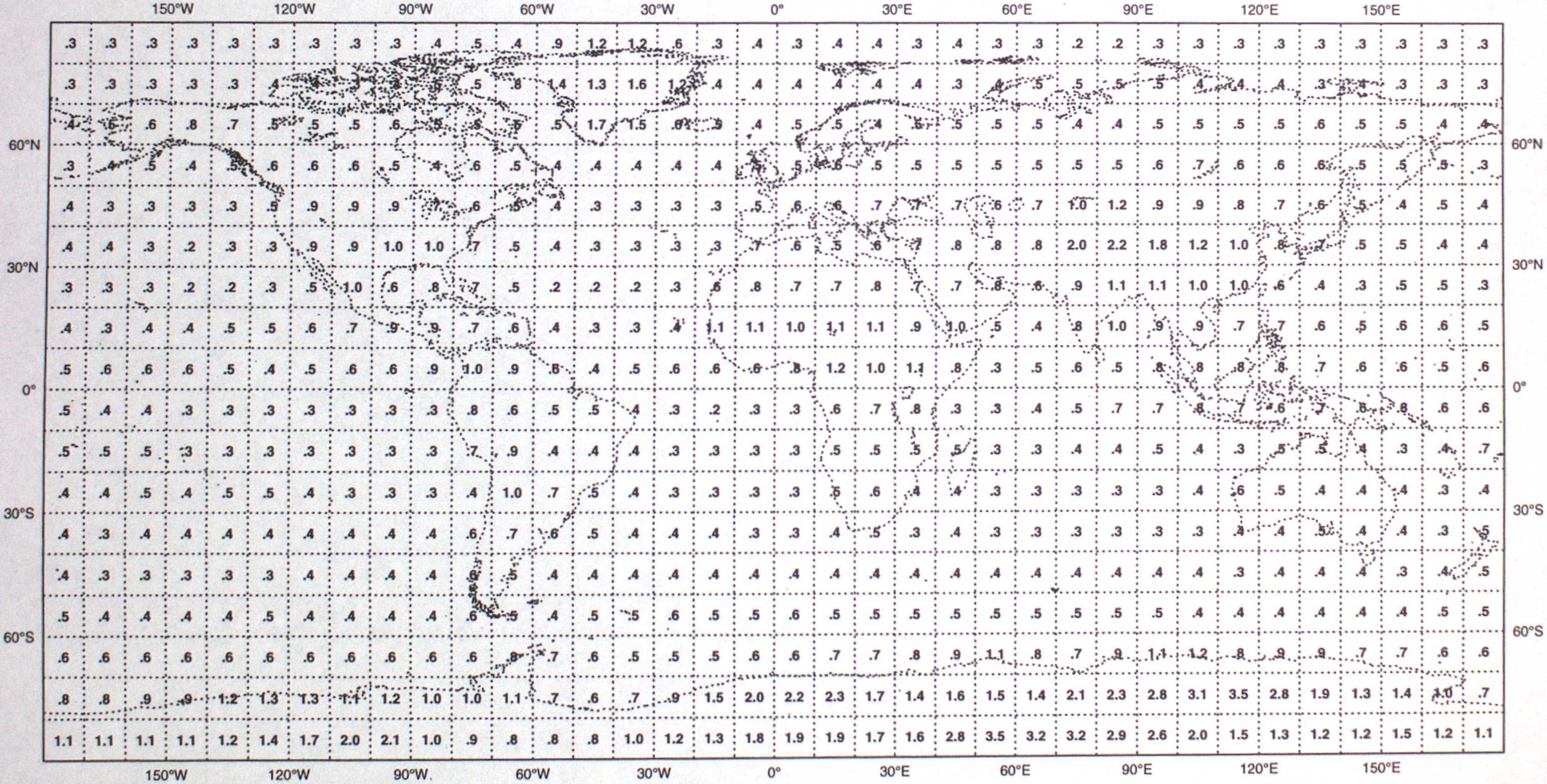

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .5 .4 .9 1.2 1.2 .6 .3 .4 .3 .4 .4 .3 .4 .3 .3 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .4 .4 .3 .3 .5 .5 .8 1.4 1.3 1.6 1.2 .4 .4 .4 .4 .4 .4 .3 .4 .5 .5 .5 .5 .4 .4 .4 .3 .4 .3 .3 .3
.4 .5 .6 .8 .7 .5 .5 .5 .6 .5 .5 .5 .5 1.7 1.5 .6 .5 .4 .5 .5 .4 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .6 .5 .5 .4 .4
.3 .4 .5 .4 .5 .6 .6 .6 .5 .4 .6 .5 .4 .4 .4 .4 .4 .4 .5 .6 .5 .5 .5 .5 .5 .5 .5 .6 .7 .6 .6 .6 .5 .5 .5 .3
.4 .3 .3 .3 .3 .5 .9 .9 .9 .7 .6 .5 .4 .3 .3 .3 .3 .5 .6 .6 .7 .7 .7 .6 .7 1.0 1.2 .9 .9 .8 .7 .6 .5 .4 .5 .4
.4 .4 .3 .2 .3 .3 .9 .9 1.0 1.0 .7 .5 .4 .3 .3 .3 .3 .7 .6 .5 .6 .7 .8 .8 .8 2.0 2.2 1.8 1.2 1.0 .8 .7 .5 .5 .4 .4
.3 .3 .3 .2 .2 .3 .5 1.0 .6 .8 .7 .5 .2 .2 .2 .3 .6 .8 .7 .7 .8 .7 .7 .8 .6 .9 1.1 1.1 1.0 1.0 .6 .4 .3 .5 .5 .3
.4 .3 .4 .4 .5 .5 .6 .7 .9 .9 .7 .6 .4 .3 .3 .4 1.1 1.1 1.0 1.1 1.1 .9 1.0 .5 .4 .8 1.0 .9 .9 .7 .7 .6 .5 .6 .6 .5
.5 .6 .6 .6 .5 .4 .5 .6 .6 .9 1.0 .9 .8 .4 .5 .6 .6 .6 .8 1.2 1.0 1.1 .8 .3 .5 .6 .5 .8 .8 .8 .8 .7 .6 .6 .5 .6
.5 .4 .4 .3 .3 .3 .3 .3 .3 .3 .8 .6 .5 .5 .4 .3 .2 .3 .3 .6 .7 .8 .3 .3 .4 .5 .7 .7 .8 .7 .6 .7 .8 .8 .6 .6
.5 .5 .5 .3 .3 .3 .3 .3 .3 .3 .7 .9 .4 .4 .4 .3 .3 .3 .3 .5 .5 .5 .5 .3 .3 .4 .4 .5 .4 .3 .5 .5 .4 .3 .4 .7
.4 .4 .5 .4 .5 .5 .4 .3 .3 .3 .4 1.0 .7 .5 .4 .3 .3 .3 .3 .5 .6 .4 .4 .3 .3 .3 .3 .3 .4 .6 .5 .4 .4 .4 .3 .4
.4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .6 .7 .6 .5 .4 .4 .4 .3 .3 .4 .5 .3 .4 .3 .3 .3 .3 .3 .3 .4 .4 .5 .4 .4 .3 .5
.4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .6 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .3 .4 .5
.5 .4 .4 .4 .4 .5 .4 .4 .4 .4 .6 .5 .4 .5 .5 .6 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .5
.6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .8 .7 .6 .5 .5 .5 .6 .6 .7 .7 .8 .9 1.1 .8 .7 .9 1.1 1.2 .8 .9 .9 .7 .7 .6 .6
.8 .8 .9 .9 1.2 1.3 1.3 1.1 1.2 1.0 1.0 1.1 .7 .6 .7 .9 1.5 2.0 2.2 2.3 1.7 1.4 1.6 1.5 1.4 2.1 2.3 2.8 3.1 3.5 2.8 1.9 1.3 1.4 1.0 .7
1.1 1.1 1.1 1.1 1.2 1.4 1.7 2.0 2.1 1.0 .9 .8 .8 .8 1.0 1.2 1.3 1.8 1.9 1.9 1.7 1.6 2.8 3.5 3.2 3.2 2.9 2.6 2.0 1.5 1.3 1.2 1.2 1.5 1.2 1.1
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

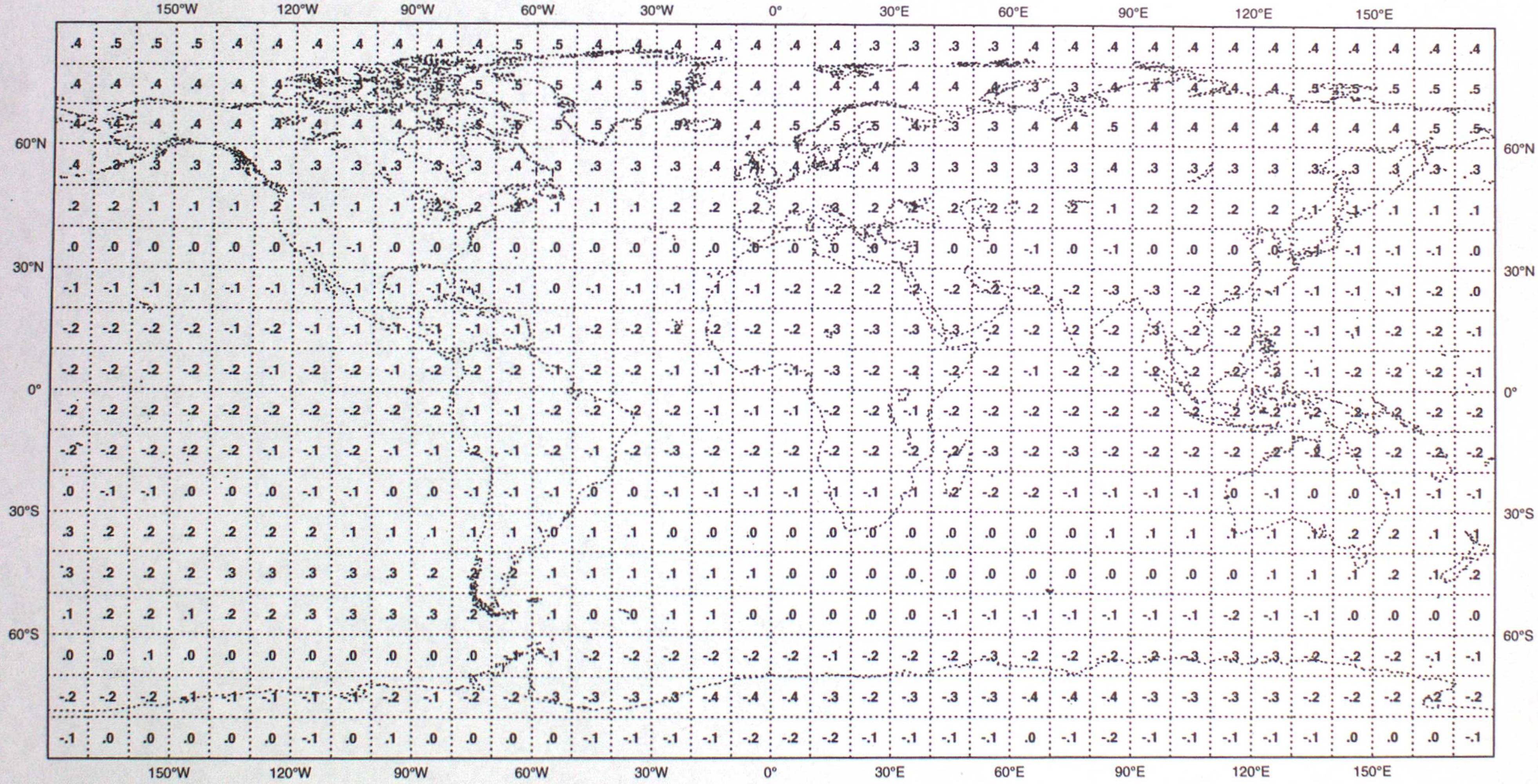

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

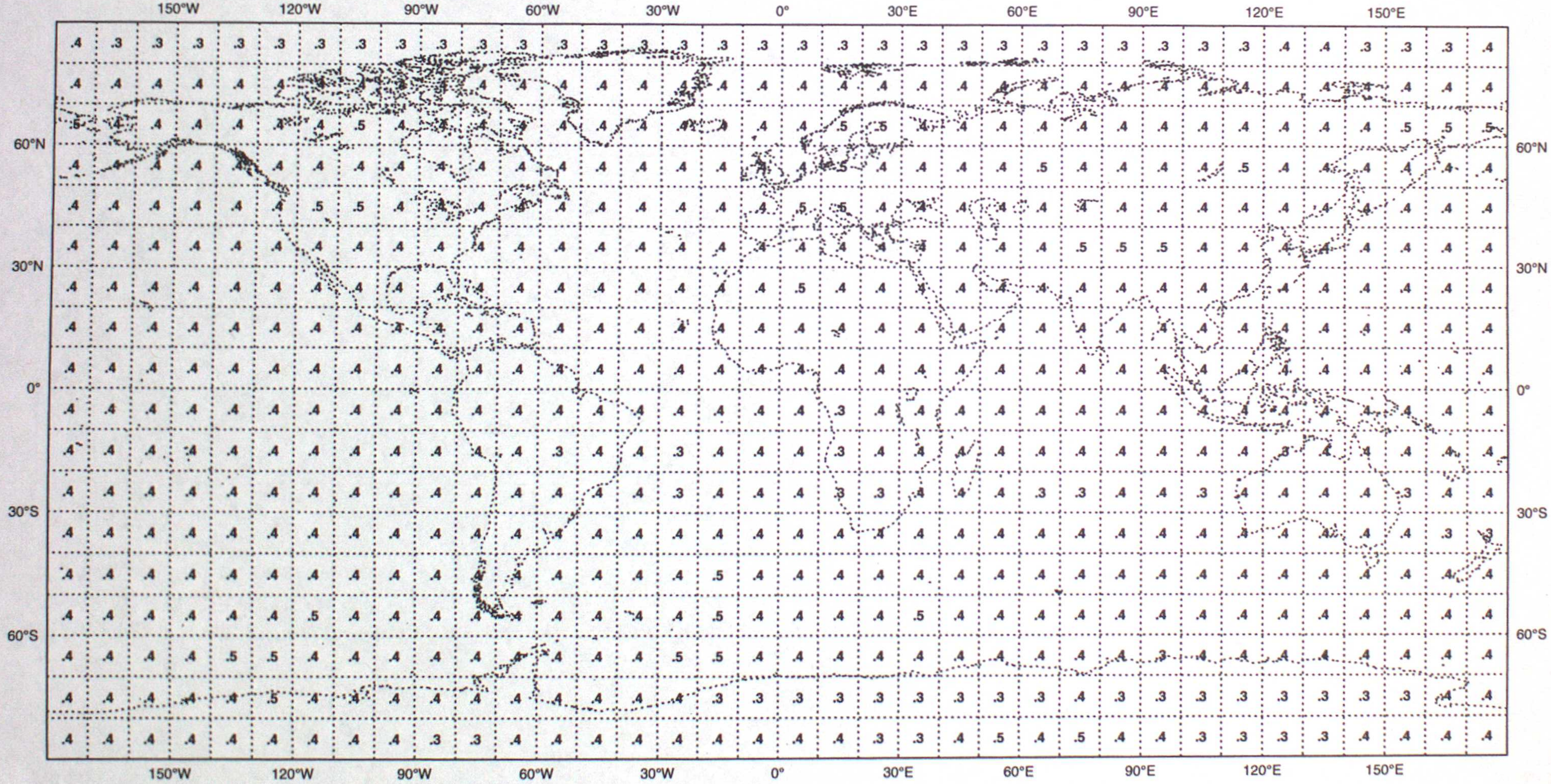

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

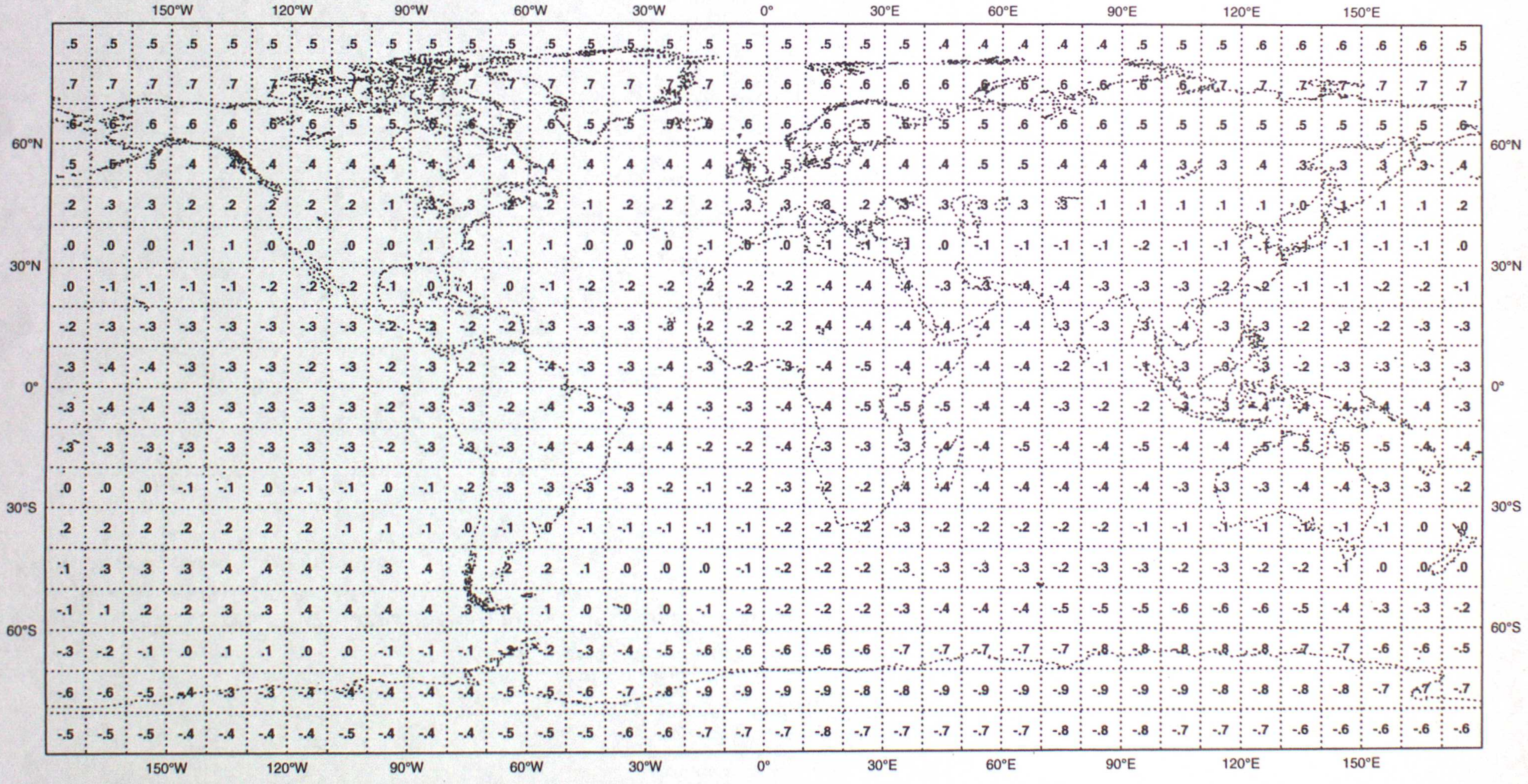
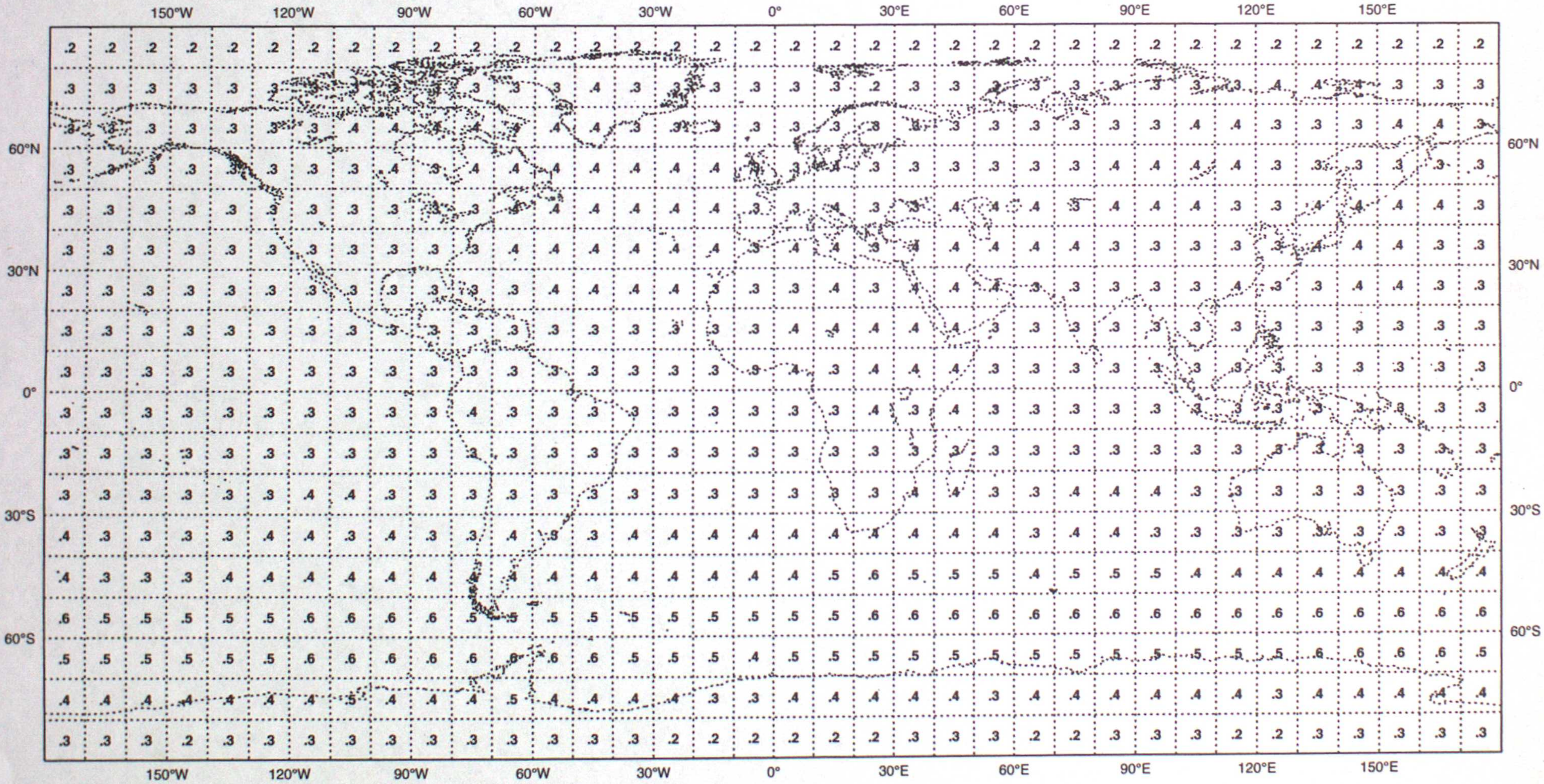

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). JULY 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations



.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.3	.4	.4	.3
.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.4	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.3	.3	.4	.3	.3	.4	.4	.4	.3	.4	.4	.4	.3	.3	.4	.4	.4	.4	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.3	.4	.4	.3	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.4	.3	.4	.4	.4	.3	.3	.3	.3	.3	.4	.3	.3	.4	.4	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3
.4	.3	.3	.3	.3	.4	.4	.3	.4	.3	.3	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3
.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.6	.5	.5	.5	.4	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4
.6	.5	.5	.5	.5	.5	.6	.6	.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6
.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.5
.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.5	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4
.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.2	.2	.2	.2	.2	.3	.3	.3	.2	.2	.3	.3	.3	.2	.2	.3	.3	.3	.3	.3

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures
Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the wind observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13531	21.6	-29.3	P	710	0	3	0.5	-0.2	0.6
13533	18.9	-56.5	P	559	0	3	0.5	0.5	0.6
13600	21.9	-42.0	P	529	0	12	0.5	1.2	1.3
13602	20.0	-41.4	P	399	0	1	0.5	0.3	0.6
41504	24.2	-84.2	P	1146	0	68	1.1	-0.3	1.2
41520	22.0	-63.5	P	1130	0	69	0.5	0.1	0.6
41538	25.6	-74.9	P	211	100	100			
41539	25.0	-72.6	P	285	1	2	0.5	0.8	1.0
41540	26.1	-75.4	P	276	0	1	0.5	0.7	0.9
41541	24.2	-76.2	P	256	0	2	0.5	1.0	1.1
41542	24.5	-68.4	P	251	0	4	0.5	0.5	0.7
41543	23.3	-71.1	P	250	0	1	0.6	0.4	0.7
41544	23.3	-67.4	P	248	0	1	0.6	0.7	1.0
41545	21.3	-69.1	P	265	0	4	0.5	1.0	1.2
41548	15.7	-50.4	P	399	0	42	0.8	0.6	1.0
41549	14.8	-55.2	P	379	0	42	0.7	0.8	1.1
41550	10.8	-45.8	P	340	0	43	0.8	0.7	1.0
41551	15.2	-45.5	P	349	0	42	0.8	0.6	1.0
41590	26.9	-62.8	P	484	0	1	0.5	1.8	1.8
41594	26.0	-43.0	P	553	0	1	0.4	-0.1	0.5
41595	23.9	-40.8	P	523	0	2	0.5	0.9	1.0
41600	41.0	-54.5	P	587	0	1	0.6	-0.4	0.7
41601	37.1	-38.5	P	604	0	0	0.5	-0.1	0.5
41631	30.9	-76.0	P	436	0	3	0.8	1.4	1.6
41646	26.4	-75.6	P	472	0	1	0.5	0.9	1.0
41655	23.6	-56.9	P	425	0	1	0.5	1.3	1.4
44546	49.8	-13.7	P	579	0	2	0.4	-0.4	0.6
44547	57.1	-41.8	P	647	0	2	0.6	-0.3	0.7
44549	49.3	-49.5	P	661	1	2	0.6	0.0	0.6
44551	54.1	-15.6	P	619	0	1	0.8	0.5	0.9
44603	60.8	-8.8	P	714	0	4	0.4	0.0	0.4
44606	29.4	-63.1	P	3	0	0	1.0	0.0	1.0
44609	58.2	-14.0	P	650	0	3	0.8	-0.9	1.2
44612	52.8	-18.9	P	565	0	1	0.4	-0.2	0.5
44614	59.8	-39.3	P	674	0	2	0.9	-0.7	1.2
44617	45.6	-44.4	P	610	0	1	0.6	-0.3	0.7
44623	29.0	-47.0	P	668	0	2	0.4	-0.2	0.5
44624	52.4	-42.8	P	617	0	0	0.6	-0.3	0.6
44625	60.1	-38.0	P	655	0	2	0.7	0.4	0.8
44626	43.0	-51.7	P	588	0	1	0.6	0.2	0.7
44627	49.2	-30.9	P	657	0	12	0.5	-0.4	0.6
44628	33.5	-24.1	P	653	0	1	0.5	-0.9	1.1
44629	47.1	-50.2	P	40	45	100	0.6	14.0	14.0
44630	28.1	-36.6	P	1081	0	39	0.6	0.2	0.6
44742	49.5	-25.8	P	569	0	0	0.5	0.2	0.6
44743	48.9	-21.3	P	559	0	1	0.4	-0.2	0.5
44745	50.7	-26.2	P	707	0	1	0.5	-0.2	0.5
44747	50.4	-16.9	P	633	0	2	0.5	0.1	0.6
44761	52.0	-33.8	P	580	0	1	0.6	-0.2	0.6
44765	39.9	-41.5	P	606	2	8	2.4	-0.1	2.4
44766	51.4	-22.4	P	677	0	12	0.4	-0.7	0.8
44771	46.3	-10.7	P	114	0	28	0.5	-0.4	0.6
44773	64.6	-32.1	P	289	0	26	0.7	-0.3	0.7
44777	23.3	-34.1	P	246	0	16	0.5	-0.4	0.6
44778	30.4	-23.9	P	294	0	20	0.5	-0.1	0.5
44780	63.4	-20.0	P	189	0	41	0.5	-0.1	0.5
48613	75.2	-15.6	P	686	0	1	0.9	0.0	0.9
62514	30.3	-29.4	P	689	0	1	0.5	0.1	0.5
62517	27.8	-42.5	P	699	0	1	0.5	-0.8	0.9
62551	30.1	-22.4	P	679	5	17	2.3	0.6	2.4
62556	42.7	-14.6	P	699	0	1	0.4	-0.4	0.6
62557	43.4	-13.7	P	704	0	2	0.4	-0.3	0.5

62558	44.0	-17.9	P	1187	0	44	0.5	-0.2	0.5
62559	45.8	-18.9	P	15	7	100	1.9	9.0	9.2
62560	42.7	-16.2	P	626	0	2	0.4	0.5	0.6
62561	49.1	-21.9	P	643	0	2	0.4	-0.5	0.7
62562	51.8	-23.8	P	650	0	2	0.7	0.1	0.7
62563	53.8	-23.1	P	699	0	2	0.5	-0.5	0.7
62564	46.3	-21.3	P	710	0	2	0.5	0.0	0.5
62565	54.6	-19.4	P	693	0	1	0.6	-0.4	0.7
62566	56.0	-30.8	P	700	0	1	0.6	-0.5	0.8
62576	44.2	-10.9	P	93	0	1	0.7	-0.3	0.7
62694	50.3	-15.0	P	579	0	1	0.4	-0.3	0.5
62712	62.0	-7.1	P	657	0	3	0.4	-0.3	0.5
62801	30.1	-21.2	P	634	0	6	1.7	0.5	1.8
64524	62.7	-33.2	P	637	1	2	0.6	-0.1	0.6
64608	64.9	-31.8	P	681	0	2	0.6	-0.8	1.0
65597	52.5	-43.5	P	409	0	28	0.6	-0.3	0.7
65598	56.6	-29.0	P	377	0	29	0.6	-0.5	0.8
65599	57.1	-29.6	P	254	0	22	0.6	-0.5	0.8
65600	58.4	-38.2	P	178	1	16	0.8	-0.2	0.8

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13600	21.9	-42.0	SPEED	528	0	100	0.9	-2.0	2.2
13602	20.0	-41.4	SPEED	400	0	100	0.8	-1.7	1.9
41539	25.0	-72.6	SPEED	272	0	100	2.4	1.2	2.7
41540	26.1	-75.4	SPEED	254	0	100	2.0	0.3	2.0
41541	24.2	-76.2	SPEED	249	0	100	1.8	0.4	1.9
41542	24.5	-68.4	SPEED	244	0	100	2.5	0.5	2.5
41543	23.3	-71.1	SPEED	231	0	100	2.1	1.3	2.5
41544	23.3	-67.4	SPEED	232	0	100	2.4	1.1	2.6
41545	21.3	-69.1	SPEED	164	0	100	2.4	1.1	2.6
41590	26.9	-62.8	SPEED	292	0	100	5.2	10.1	11.4
41595	23.9	-40.8	SPEED	511	0	100	1.0	-1.4	1.7
44546	49.8	-13.7	SPEED	576	0	100	1.7	0.2	1.7
44551	54.1	-15.6	SPEED	14	0	100	6.1	10.1	11.8
48613	75.2	-15.6	SPEED	670	1	100	1.7	-0.8	1.9
62565	54.6	-19.4	SPEED	586	0	100	1.8	0.4	1.9
62566	56.0	-30.8	SPEED	631	0	100	1.5	-0.1	1.5

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13600	21.9	-42.0	DIRN.	332	0	0	27.4	3.6	27.6
13602	20.0	-41.4	DIRN.	265	0	0	9.6	-22.0	24.0
20501 OU	61.9	-24.5	DIRN.	1	0	0	0.0	13.2	13.2
20502 OV	71.2	-57.7	DIRN.	1	0	0	0.0	3.4	3.4
41539	25.0	-72.6	DIRN.	159	0	0	20.9	-18.0	27.6
41540	26.1	-75.4	DIRN.	110	0	0	24.3	-11.4	26.9
41541	24.2	-76.2	DIRN.	48	0	0	23.6	-20.7	31.3
41542	24.5	-68.4	DIRN.	204	0	0	32.8	32.2	46.0
41543	23.3	-71.1	DIRN.	211	0	0	24.4	23.3	33.8
41544	23.3	-67.4	DIRN.	219	0	0	44.3	25.6	51.2
41545	21.3	-69.1	DIRN.	160	0	0	16.5	7.8	18.3
41590	26.9	-62.8	DIRN.	153	0	0	16.7	-20.4	26.4
41595	23.9	-40.8	DIRN.	307	0	0	12.9	-30.6	33.2
44546	49.8	-13.7	DIRN.	258	0	0	16.9	9.5	19.4
44551	54.1	-15.6	DIRN.	12	0	0	24.4	43.7	50.1
48613	75.2	-15.6	DIRN.	95	5	0	164.7	-39.8	169.5
62565	54.6	-19.4	DIRN.	476	0	0	22.1	-9.9	24.2
62566	56.0	-30.8	DIRN.	505	0	0	16.4	-6.7	17.7

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

IDENT.	TEMPERATURE					WIND					
	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	927	0	9	1.7	0.1	643	0	7	0	6.8	0.6
ACA	1314	1	3	1.8	-0.3	771	0	2	0	5.9	0.3
AEA	418	0	3	1.4	-0.1	388	0	4	0	7.4	-0.3
AEL	234	1	13	1.6	-0.3	226	0	12	0	6.5	-0.1
AEW	48	0	0	1.6	-0.7	20	0	0	0	3.3	-0.3
AFL	531	0	5	2.1	0.2	283	0	3	0	7.9	-0.3
AFR	773	0	4	1.5	0.2	758	0	5	0	7.3	-0.1
AJM	294	0	2	1.4	-0.3	239	0	4	0	8.1	0.6
AMT	64	0	9	1.6	0.1	63	0	13	0	9.1	-0.1
AMX	323	2	4	1.4	0.1	288	0	6	0	8.9	-0.3
AVA	39	0	5	1.3	0.2	39	0	8	0	8.9	1.8
AZA	418	0	4	1.6	-0.1	330	0	5	0	6.6	0.3
BAL	257	0	11	1.6	-0.2	251	0	13	0	8.5	0.3
BAW	466	1	15	2.0	-0.9	312	0	15	0	7.1	0.0
BHP	45	4	9	2.3	-1.3	32	0	0	0	5.5	-0.7
BPA	229	0	11	1.9	-0.2	229	0	11	0	6.2	-0.7
BWA	139	1	4	1.4	0.0	133	0	8	0	8.5	-0.1
CFG	428	0	3	1.5	-0.1	373	0	5	0	7.4	0.1
CKS	168	2	8	2.1	0.4	116	0	3	0	6.7	-0.7
CLX	256	0	1	1.6	-0.4	160	0	1	0	6.3	-0.3
COA	211	1	51	1.6	-0.2	149	0	51	0	6.8	0.3
CRL	422	1	4	1.3	0.5	407	0	4	0	7.9	0.2
CUB	128	1	2	1.6	0.1	113	0	4	0	8.5	-0.1
DAL	1114	0	5	1.4	-0.4	782	0	5	0	7.8	0.2
DCE	50	4	16	1.9	0.9	50	0	12	0	8.1	2.5
DHL	114	2	100	6.4	-5.8	68	0	37	0	16.2	5.2
DLH	678	0	11	1.8	-0.2	621	0	13	0	7.9	0.6
DRD	78	4	6	1.7	0.0	77	0	14	0	12.2	-3.3
EDW	78	0	1	1.6	-0.4	68	0	6	0	9.5	-0.9
EEZ	51	0	2	1.4	-0.2	51	0	2	0	7.3	0.3
EIA	254	0	18	2.2	0.5	249	0	100	0	20.4	7.4
ELY	171	5	7	1.7	-0.3	121	0	2	0	6.3	0.2
ETH	31	0	10	1.2	0.3	30	0	10	0	4.8	-0.2
FCA	131	1	4	1.4	0.2	100	0	8	0	8.8	0.1
FDX	687	0	41	1.5	0.2	520	0	38	0	7.3	0.0
FIN	393	1	5	1.8	0.1	301	0	6	0	6.9	-0.7
FWI	346	1	4	1.5	-0.3	355	0	8	0	9.5	-1.2
GAF	49	2	10	2.0	-1.5	30	0	0	0	5.6	0.1
GCO	165	0	14	1.4	-0.1	159	0	26	0	11.7	2.9
GRL	121	0	4	2.0	0.3	108	0	2	0	6.0	0.8
GTI	164	4	19	2.0	0.5	161	0	19	0	9.2	0.9
HXL	191	0	3	1.4	0.0	152	0	4	0	8.1	-0.1
IBE	1361	1	6	1.5	0.2	1353	0	7	0	7.5	0.0
ICE	1192	0	4	1.7	-0.1	750	0	3	0	6.0	0.3
ISR	43	2	5	1.1	-0.3	29	0	3	0	5.7	1.4
IWD	184	0	3	1.5	0.2	183	0	7	0	7.5	-0.6
KLM	945	0	2	1.8	-0.1	653	0	3	0	6.8	0.3
LAN	33	0	15	1.7	0.2	34	0	15	0	7.3	0.9
LDI	217	1	4	1.6	0.1	196	0	6	0	7.8	-0.6
LOT	253	1	4	2.2	-0.6	171	0	2	0	5.6	0.6
LTU	696	1	6	1.5	-0.3	566	0	6	0	7.8	0.2
LXR	35	0	3	1.1	-0.2	22	0	5	0	6.5	-0.4
MMZ	68	0	10	2.2	0.9	70	1	16	0	10.7	-0.7
MON	63	0	5	1.5	0.0	50	2	8	0	8.0	0.0
MPD	211	0	1	1.7	0.1	184	0	3	0	6.8	0.0
MPH	435	0	2	1.7	-0.9	303	1	4	0	5.9	-0.1
MYT	290	0	7	1.6	-0.1	196	0	11	0	8.9	-0.4
NAO	38	0	8	1.8	-0.1	31	0	19	0	11.2	-0.3
NCA	34	0	0	1.4	0.8	30	0	0	0	4.4	0.1

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
NWA	1623	1	3	1.9	0.2	1592	0	3	0	7.2	0.0
OAE	166	0	9	1.7	-0.2	96	0	45	0	19.0	4.3
OOM	158	1	4	2.1	-1.3	106	0	4	0	4.5	-0.1
PAC	180	1	9	1.7	-0.1	125	1	10	0	8.4	-0.7
PLM	139	0	5	1.6	0.6	129	0	5	0	7.0	0.3
RAM	304	0	2	1.6	0.8	223	0	32	0	8.2	-0.8
RCH	176	1	100	3.3	-1.6	143	0	100	0	14.9	1.7
RRR	73	3	15	2.0	-0.4	68	0	18	0	9.4	2.1
RZO	412	1	4	1.6	-0.5	359	0	3	0	6.8	0.5
SCY	38	0	11	2.3	0.6	37	0	11	0	6.8	0.9
SEU	140	1	5	1.5	0.1	127	0	6	0	6.9	0.0
SSV	60	0	8	1.8	-0.3	40	0	15	0	12.2	0.1
TAG	34	0	6	2.5	-0.7	23	0	9	0	5.2	-0.2
TAP	307	1	2	1.4	-0.5	258	0	2	0	7.9	0.5
TCX	85	0	1	1.4	0.3	54	0	7	0	9.9	-1.4
TSC	416	0	3	1.7	-0.5	307	0	3	0	6.8	0.7
UAL	195	1	56	2.1	-1.2	127	0	54	0	7.5	0.6
UPS	991	1	51	1.5	-0.3	946	0	54	0	8.1	-0.2
VIR	242	1	3	1.7	0.0	142	0	3	0	7.7	0.7
WOA	277	1	9	1.8	0.0	234	0	10	0	8.9	0.5
XLA	46	0	0	1.1	0.0	46	0	4	0	7.8	0.7

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
EU	32185	0	18	1.3	0.1	32185	0	17	0	4.1	0.2
TN	30	0	17	2.9	1.3	31	0	13	0	6.5	1.5

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	509	1	7	2.3	0.6	299	0	2	0	6.6	0.0
US ACARS	22665	0	33	1.5	0.2	22665	0	32	0	4.6	0.1

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.1	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	6	0	7.1	15.3	13.5
DBBH	12	Z	100	22	0	13.3	27.2	23.7
DBLK	12	Z	100	27	0	12.4	26.8	23.8
EBUQ	12	Z	100	19	0	14.9	15.0	0.8
ELML7	00	Z	100	7	0	8.5	11.3	7.4
ELML7	12	Z	100	5	0	10.3	11.6	5.4
FQFL	00	Z	100	6	0	39.5	39.6	-3.0
FQFL	12	Z	100	5	0	33.7	35.7	-11.8
FQFM	00	Z	100	4	0	3.4	6.4	-5.5
FQFM	12	Z	100	11	0	19.2	20.9	-8.1
KHRH	00	Z	100	8	0	48.6	48.7	3.3
KHRH	12	Z	100	8	0	16.3	25.7	19.9
KRPD	00	Z	100	1	0	0.0	1.0	1.0
KRPD	12	Z	100	2	0	3.0	21.2	21.0
LDWR	00	Z	100	28	0	6.9	7.2	-2.1
LDWR	12	Z	100	29	0	10.2	11.4	-5.0
OXVH2	00	Z	100	3	0	12.8	29.9	27.0
OXVH2	12	Z	100	3	1	6.4	18.2	17.0
OXYH2	00	Z	100	3	0	5.4	8.3	6.3
OXYH2	12	Z	100	6	0	11.2	17.3	13.2
V2XM	00	Z	100	5	0	18.2	25.4	17.8
V2XM	12	Z	100	5	0	10.6	30.3	28.4
WAAH	00	Z	100	6	0	10.3	13.7	9.0
WAAH	12	Z	100	7	0	7.1	20.7	19.4
WPKD	00	Z	100	4	0	9.3	15.2	12.0
WPKD	12	Z	100	7	0	14.0	15.4	6.4
ZCBP6	00	Z	100	10	0	35.0	43.2	25.3
ZCBP6	12	Z	100	9	1	16.5	32.2	27.7
03953	00	Z	100	28	0	8.6	13.3	10.1
03953	12	Z	100	30	0	10.5	12.7	7.2
04018	00	Z	100	27	0	10.0	17.1	14.0
04018	12	Z	100	30	0	9.0	20.8	18.8
04220	00	Z	100	27	1	44.8	45.2	5.9
04220	12	Z	100	27	1	9.5	22.3	20.2
04270	00	Z	100	27	1	10.4	19.8	16.8
04270	12	Z	100	29	1	9.5	26.1	24.3
04339	00	Z	100	28	0	9.5	20.2	17.8
04339	12	Z	100	30	0	10.5	20.4	17.5
04360	00	Z	100	28	0	15.5	19.9	12.5
04360	12	Z	100	29	0	17.9	22.0	12.8
08001	00	Z	100	21	1	22.6	34.0	-25.5
08001	12	Z	100	21	0	28.0	37.9	-25.6
08508	12	Z	100	26	1	8.4	8.4	0.3
08522	12	Z	100	29	0	9.5	9.5	0.9
08594	12	Z	100	22	0	49.8	49.8	-0.5
71600	00	Z	100	28	0	8.9	9.8	4.1
71600	12	Z	100	30	0	14.4	14.6	2.2
72201	00	Z	100	27	0	10.3	26.8	24.8
72201	12	Z	100	30	0	10.0	32.0	30.4
72402	00	Z	100	27	0	11.6	15.8	10.8
72402	12	Z	100	30	0	12.3	19.9	15.6
74494	00	Z	100	24	0	7.9	15.0	12.8
74494	12	Z	100	25	0	10.3	10.4	1.2
78016	00	Z	100	27	0	17.5	29.2	23.4
78016	12	Z	100	29	0	14.7	33.2	29.8

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	6	0	3.9	4.8	-2.7
DBBH	12	Z	500	22	0	5.7	5.8	0.6
DBLK	12	Z	500	28	0	6.9	14.4	12.7
EBUQ	12	Z	500	22	0	6.6	9.2	-6.5
ELML7	00	Z	500	7	0	8.1	8.5	2.3
ELML7	12	Z	500	5	0	7.6	10.3	7.0
FQFL	00	Z	500	6	0	17.3	17.8	4.2
FQFL	12	Z	500	5	0	15.4	15.9	-3.8
FQFM	00	Z	500	8	0	8.7	9.1	-2.6
FQFM	12	Z	500	12	0	5.5	7.4	-5.0
KHRH	00	Z	500	8	0	23.3	26.8	13.3
KHRH	12	Z	500	8	0	8.2	24.4	23.0
KRPD	00	Z	500	1	0	0.0	5.0	5.0
KRPD	12	Z	500	2	0	1.0	1.0	0.0
LDWR	00	Z	500	28	0	7.5	7.5	0.4
LDWR	12	Z	500	29	0	12.0	12.2	-2.1
OXVH2	00	Z	500	3	1	2.2	14.2	14.0
OXVH2	12	Z	500	3	1	4.2	6.8	5.3
OXYH2	00	Z	500	4	0	8.4	8.9	3.0
OXYH2	12	Z	500	7	0	8.9	12.6	9.0
V2XM	00	Z	500	5	0	10.6	14.2	9.4
V2XM	12	Z	500	6	0	10.6	20.6	17.7
WAAH	00	Z	500	6	0	5.4	6.4	-3.3
WAAH	12	Z	500	7	0	8.2	8.9	3.4
WPKD	00	Z	500	5	0	6.1	7.9	5.0
WPKD	12	Z	500	8	0	7.7	7.8	-1.0
ZCBP6	00	Z	500	10	0	20.4	30.7	22.9
ZCBP6	12	Z	500	11	0	25.5	42.7	34.3
03953	00	Z	500	28	0	4.3	5.0	2.5
03953	12	Z	500	30	0	5.4	5.8	2.3
04018	00	Z	500	27	0	10.7	15.0	10.4
04018	12	Z	500	30	0	8.4	14.5	11.8
04220	00	Z	500	28	0	22.6	24.3	8.8
04220	12	Z	500	28	0	6.6	14.2	12.6
04270	00	Z	500	27	1	6.8	14.3	12.6
04270	12	Z	500	30	0	10.5	15.2	10.9
04339	00	Z	500	28	0	7.4	18.3	16.7
04339	12	Z	500	30	0	7.1	13.3	11.3
04360	00	Z	500	28	0	11.7	14.6	8.6
04360	12	Z	500	29	0	9.8	11.1	5.3
08001	00	Z	500	26	0	12.7	15.7	-9.3
08001	12	Z	500	25	2	13.0	17.8	-12.2
08508	12	Z	500	29	0	6.2	6.3	-0.7
08522	12	Z	500	29	0	4.8	4.8	-0.4
08594	12	Z	500	23	0	7.9	9.9	-6.0
71600	00	Z	500	28	0	4.8	4.8	-0.2
71600	12	Z	500	30	0	7.8	8.0	1.9
72201	00	Z	500	28	0	6.5	7.0	-2.6
72201	12	Z	500	30	0	5.8	5.9	-0.9
72402	00	Z	500	28	0	9.5	9.6	-1.2
72402	12	Z	500	30	0	7.0	8.1	4.0
74494	00	Z	500	27	0	6.7	6.7	0.7
74494	12	Z	500	29	0	7.9	7.9	0.4
78016	00	Z	500	28	0	14.9	20.0	13.4
78016	12	Z	500	30	0	9.9	19.3	16.6

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

```
 WMO  OBS                NUM    NUM     %
IDENT TIME ELM   LEV    OBS   GROSS   REJ     RMS    UBIAS   VBIAS


DBBH   00   V    100      6      0      0     5.3     3.3     1.5
DBBH   12   V    100     22      0      0     6.7     0.3    -0.5
DBLK   12   V    100     27      0      0     3.1     0.2    -0.1
EBUQ   12   V    100     12      0    100     9.6     0.9     0.2
ELML7  00   V    100      7      0      0     9.1     6.3     5.9

ELML7  12   V    100      5      0      0     8.3     6.4     4.7
FQFL   00   V    100      6      0      0     2.2     1.2     1.0
FQFL   12   V    100      5      0      0     5.2     0.5    -0.4
FQFM   00   V    100      5      0      0     3.5    -0.2    -1.3
FQFM   12   V    100     11      0      0     4.0    -0.3     0.8

KHRH   00   V    100      7      0    100     8.4    -5.6     0.0
KHRH   12   V    100      6      0    100     9.5    -2.8    -1.3
KRPD   00   V    100      1      0      0     2.6    -0.1     2.6
KRPD   12   V    100      1      0      0     1.3    -1.0     0.9
LDWR   00   V    100     28      0      0     2.5     0.1    -0.3

LDWR   12   V    100     29      0      0     2.6     0.0    -0.2
OXVH2  00   V    100      2      0      0     2.8    -1.5     1.0
OXVH2  12   V    100      2      0      0     3.6     0.4    -2.2
OXYH2  00   V    100      1      0      0     2.1     1.9     0.8
OXYH2  12   V    100      6      0      0     7.3    -0.8     3.9

V2XM   00   V    100      4      0     25     1.2     0.8    -0.2
V2XM   12   V    100      5      0     60     3.4    -0.2     0.7
WAAH   00   V    100      3      0    100     7.9    -5.7    -0.9
WAAH   12   V    100      6      0    100     7.6    -6.9    -1.5
WPKD   00   V    100      4      0     50     5.9    -3.4     1.5

WPKD   12   V    100      6      0     50     4.9     0.6    -0.7
ZCBP6  00   V    100      5      0      0     3.7    -1.0    -1.3
ZCBP6  12   V    100      6      0      0     7.7     3.0    -0.2
03953  00   V    100     28      0      0     2.7    -0.5     0.5
03953  12   V    100     30      0      0     2.2    -0.3     0.2

04018  00   V    100     27      0      0     2.1     0.2     0.5
04018  12   V    100     30      0      0     1.8     0.4    -0.1
04220  00   V    100     25      0      0     2.5    -0.8    -0.5
04220  12   V    100     27      0      0     2.6    -0.7     0.1
04270  00   V    100     25      0      0     3.2    -0.5     0.2

04270  12   V    100     27      0      0     3.5    -0.8     0.6
04339  00   V    100     24      0      0     4.3    -0.3     0.6
04339  12   V    100     26      0      0     5.4    -0.4     1.3
04360  00   V    100     26      0      0     1.9    -1.0     0.3
04360  12   V    100     28      0      0     2.3    -0.9    -0.4

08001  00   V    100     21      0      0     4.1     0.6     0.4
08001  12   V    100     19      0      0     3.4     1.2    -0.4
08508  12   V    100     16      0      0     3.0    -0.2     0.5
08522  12   V    100     29      0      0     3.9    -0.1    -0.2
08594  12   V    100     21      0    100     4.0     0.3    -1.5

71600  00   V    100     28      0      0     3.0    -0.3    -0.7
71600  12   V    100     30      0      0     3.4     0.4     0.0
72201  00   V    100     27      0      0     3.6     1.9    -1.1
72201  12   V    100     30      0      0     2.7     1.0    -0.6
72402  00   V    100     27      0      0     3.2    -0.5    -0.2

72402  12   V    100     30      0      0     3.3     0.2     0.1
74494  00   V    100     24      0    100     2.0     0.2    -0.6
74494  12   V    100     25      0    100     1.7    -0.2     0.3
78016  00   V    100     25      0      0     3.1    -0.7     0.5
78016  12   V    100     28      0      0     3.4    -0.2    -0.7
```

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Jul 04

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:UBIAS,VBIAS: Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	6	0	0	5.3	2.8	-1.1
DBBH	12	V	500	22	0	0	5.4	1.1	0.1
DBLK	12	V	500	28	0	0	4.9	-0.4	-0.5
EBUQ	12	V	500	15	0	100	6.2	0.3	-2.3
ELML7	00	V	500	7	0	0	9.7	7.9	4.9
ELML7	12	V	500	5	0	0	11.7	5.5	1.6
FQFL	00	V	500	6	0	0	3.2	1.9	-0.9
FQFL	12	V	500	5	0	0	3.3	0.1	-2.1
FQFM	00	V	500	7	0	0	3.8	0.9	1.6
FQFM	12	V	500	12	0	0	3.4	-0.1	-0.3
KHRH	00	V	500	7	0	100	8.4	-6.3	0.2
KHRH	12	V	500	6	0	100	11.0	-4.0	-0.5
KRPD	00	V	500	1	0	0	1.3	-1.2	0.4
KRPD	12	V	500	1	0	0	6.2	-5.3	-3.3
LDWR	00	V	500	28	0	0	2.9	-0.5	-0.2
LDWR	12	V	500	29	0	0	2.9	-0.7	-0.3
OXVH2	00	V	500	4	0	0	4.1	-0.7	-0.1
OXVH2	12	V	500	4	0	0	3.8	-0.7	2.5
OXYH2	00	V	500	3	0	0	9.0	-0.8	-1.8
OXYH2	12	V	500	5	0	20	19.6	-3.2	7.4
V2XM	00	V	500	4	0	0	2.3	-0.1	0.2
V2XM	12	V	500	6	0	0	2.6	0.5	0.0
WAAH	00	V	500	4	0	100	12.3	-11.3	-0.9
WAAH	12	V	500	6	0	100	9.7	-8.9	-2.6
WPKD	00	V	500	5	0	40	6.8	-0.3	0.0
WPKD	12	V	500	6	0	50	2.2	0.4	-0.6
ZCBP6	00	V	500	6	0	0	2.4	1.0	-0.8
ZCBP6	12	V	500	6	0	0	4.2	-1.3	1.5
03953	00	V	500	28	0	0	3.6	-0.2	-0.9
03953	12	V	500	30	0	0	2.5	0.2	-0.2
04018	00	V	500	27	0	0	4.0	0.5	0.4
04018	12	V	500	30	0	0	3.9	-0.3	0.2
04220	00	V	500	27	0	0	3.9	-0.4	0.3
04220	12	V	500	28	0	0	3.1	-0.4	-0.4
04270	00	V	500	28	0	0	4.2	-1.1	-1.0
04270	12	V	500	30	0	0	4.9	0.7	0.0
04339	00	V	500	28	0	0	4.7	-0.5	0.4
04339	12	V	500	30	0	0	3.8	-0.1	0.9
04360	00	V	500	28	0	0	4.3	-1.1	-1.1
04360	12	V	500	29	0	0	4.7	0.0	-1.3
08001	00	V	500	25	0	0	4.3	-0.5	-1.0
08001	12	V	500	27	0	0	3.2	0.0	-0.2
08508	12	V	500	18	0	0	3.6	0.9	-0.6
08522	12	V	500	29	0	0	3.4	-0.7	-0.8
08594	12	V	500	24	0	100	4.2	-0.3	-2.2
71600	00	V	500	28	0	0	3.5	0.9	-0.1
71600	12	V	500	30	0	0	2.8	0.5	-0.4
72201	00	V	500	28	0	0	2.3	-0.2	0.2
72201	12	V	500	30	0	0	2.7	-0.2	-1.4
72402	00	V	500	28	0	0	3.0	0.6	-0.5
72402	12	V	500	30	0	0	3.1	0.7	-0.5
74494	00	V	500	27	0	0	2.6	-0.6	-0.1
74494	12	V	500	29	0	0	3.1	-0.7	0.2
78016	00	V	500	26	0	0	3.2	-1.2	0.9
78016	12	V	500	29	0	0	3.4	-0.4	-0.2

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45